ANEXO A

Serie de cámaras de red AXIS M32

Domos fijos discretos y asequibles para una videovigilancia profesional.

- > Excelente calidad de imagen
- > Múltiples secuencias H.264
- > Alimentación a través de Ethernet
- > Contador de píxeles
- > Funciones de vídeo inteligente

La serie AXIS M32 está compuesta por cámaras de red rentables y compactas que resultan perfectas en los lugares donde se requieren domos discretos a prueba de manipulaciones o de agresiones, como por ejemplo en comercios o colegios. Ofrecen prácticas funciones como alimentación a través de Ethernet, un objetivo varifocal y un contador de píxeles.

La serie AXIS M32 ofrece una excelente calidad de imagen con barrido progresivo en alta resolución; las AXIS M3204 y AXIS M3204-V ofrecen una resolución de un megapíxel o HDTV 720p y las AXIS M3203/-V tienen una resolución SVGA. Proporcionan múltiples secuencias H.264 y secuencias Motion JPEG, sea a frecuencia de imagen máxima u optimizadas individualmente para que se adapten a varias necesidades de calidad y a las restricciones del ancho de banda.

El diseño mecánico de las cámaras de red AXIS M32 está adaptado para un ajuste flexible del campo de visión, lo que facilita la instalación. La alimentación a través de Ethernet suministra alimentación eléctrica a las cámaras a través de la red, lo cual elimina la necesidad de cables de alimentación y reduce los costes de instalación.

Las AXIS M3203-V y AXIS M3204-V, resistentes a las agresiones, y las AXIS M3203 y AXIS M3204, con carcasa a prueba de manipulaciones, son cámaras domo fijo adaptadas específicamente para la videovigilancia discreta en interiores expuestos.

El contador de píxeles ayuda al instalador a verificar que la resolución de píxeles de un objeto o un rostro cumpla los requisitos normativos aplicables o los específicos del cliente para la identificación.

La serie AXIS M32 incluye características inteligentes como detección de movimiento y detección de intentos de manipulación de la cámara, como bloqueos o pintura pulverizada.

HDTV NETWORK VIDEO

41250/ES/R3/1207

Especificaciones técnicas – Serie de cámaras de red AXIS M32

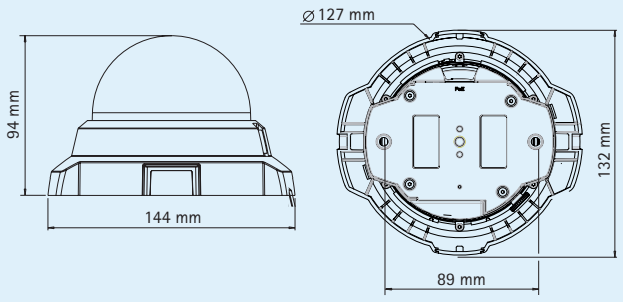
Cámara	
Modelos	**AXIS M3203**: resolución SVGA, carcasa a prueba de manipulaciones **AXIS M3203-V**: resolución SVGA, carcasa a prueba de agresiones **AXIS M3204**: MP/HDTV 720p, carcasa a prueba de manipulaciones **AXIS M3204-V**: 1 MP/HDTV 720p, carcasa a prueba de agresiones
Sensor de imagen	CMOS RGB de barrido progresivo de 1/4"
Objetivo	**AXIS M3203/-V**: varifocal 2,8 – 10 mm, visión de 66° – 18°*, F1.7, iris fijo **AXIS M3204/-V**: varifocal 2,8 – 10 mm, visión de 80° – 22°*, F1.7, iris fijo *ángulo de visión horizontal
Sensibilidad lumínica	0,9 – 100000 lux, F1.7
Velocidad de obturación	1/24500 s a 1/6 s
Ajuste del ángulo de la cámara	Horizontal 360°, vertical 170°, rotación 340°
Movimiento horizontal/vertical y zoom	PTZ digital, posiciones predefinidas, ronda de vigilancia
Vídeo	
Compresión de vídeo	H.264 (MPEG-4 Parte 10/AVC) Motion JPEG
Resoluciones	**AXIS M3203/-V**: de 800x600 a 160x90 **AXIS M3204/-V**: de 1280x800 a 160x90* *1440x900 (1.3 MP) resolución escalable disponible vía VAPIX®
Velocidad de imagen H.264	30 imágenes por segundo en todas las resoluciones
Velocidad de imagen Motion JPEG	30 imágenes por segundo en todas las resoluciones
Transmisión de vídeo	Múltiples secuencias configurables individualmente en H.264 y Motion JPEG Velocidad de imagen y ancho de banda controlables VBR/CBR H.264
Ajustes de la imagen	Compresión, color, brillo, nitidez, contraste, equilibrio de blancos, control y zona de exposición, compensación de contraluz, configuración más precisa del comportamiento con poca luz, duplicación de imágenes Rotación – incluye Corridor Format Superposición de texto e imágenes, máscara de privacidad
Red	
Seguridad	Protección por contraseña, filtrado de direcciones IP, cifrado HTTPS**, autenticación Digest, registro de acceso de usuarios
Protocolos compatibles	IPv4/v6, HTTP, HTTPS**, QoS Layer 3 DiffServ, FTP, CIFS/SMB, SMTP, Bonjour, UPnP™, SNMPv1/v2c/v3(MIB-II), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS

***Este producto incluye software desarrollado por OpenSSL Project para su uso en el kit de herramientas OpenSSL. (www.openssl.org)*

Integración del sistema	
Interfaz de programación de aplicaciones	API abierta para integración de software, incluida la especificación de ONVIF disponible en www.onvif.org, así como VAPIX® y AXIS Camera Application Platform de Axis Communications, especificaciones disponibles en www.axis.com Admite AXIS Video Hosting System (AVHS) con conexión de cámara con un solo clic
Vídeo inteligente	Detección de movimiento por vídeo y alarma antimanipulación activa Soporte para la Plataforma de aplicaciones de cámaras AXIS que permite la instalación de aplicaciones adicionales
Activadores de eventos	Vídeo inteligente
Acciones de eventos	Carga de ficheros: FTP, http, recursos compartidos de red e e-mail; notificación: e-mail, http y TCP; salida de activación externa; grabación de vídeo a edge storage; memoria pre y post alarma
Flujo de datos	Información de eventos
Ayudas de instalación integradas	Contador de píxeles
General	
Carcasa	Cubierta transparente de policarbonato Módulo de cámara interna metálica con elementos electrónicos encapsulados Color: NCS S 1002-B blanco **AXIS M3203/M3204**: carcasa de plástico a prueba de manipulaciones **AXIS M3203-V/M3204-V**: carcasa de metal a prueba de impactos, 1.000 Kg
Memoria	128 MB de RAM, 128 MB de Flash
Alimentación	Alimentación a través de Ethernet IEEE 802.3af, Clase 2 (máx. 4,2 W)
Conectores	RJ-45 10BASE-T/100BASE-TX PoE
Edge storage	Soporte de grabaciones en recurso compartido de red (Network Attached Storage o servidor de ficheros)
Condiciones de funcionamiento	0 °C a 50 °C Humedad relativa: 15 a 85% (sin condensación)
Homologaciones	EN 55022 Clase B, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Parte 15 Subparte B Clase B, ICES-003 Clase B, VCCI Clase B, C-tick AS/NZS CISPR 22, KCC Clase B, UL
Peso	**AXIS M3203/M3204**: 430 g, **AXIS M3203-V/M3204-V**: 580 g
Accesorios incluidos	Guía de instalación, CD con software de instalación y gestión, llave para tornillos a prueba de manipulaciones, descodificador Windows (1 licencia de usuario)
Software de gestión de vídeo	AXIS Camera Companion (incluido), AXIS Camera Station y software de gestión de vídeo de los Partners de Desarrollo de Aplicaciones Axis (no incluidos). Para más información consulte www.axis.com/products/video/software

Encontrará más información en www.axis.com

Dimensiones



Accesorios opcionales

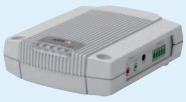
Kit de montaje en falsos techos, cubierta transparente o ahumada

Carcasas opcionales con cubierta ahumada o carcasa negra

Varios kits de montaje

Monitor de instalación AXIS T8414

Módulo Ethernet de audio y E/S AXIS P8221



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AXIS® COMMUNICATIONS

DATASHEET

AXIS Q7401 Video Encoder

Full-featured video surveillance with outstanding H.264 performance.

- > Superb video quality
- > Multiple H.264 streams
- > Image setting adjustment
- > Intelligent video capabilities
- > Power over Ethernet
- > Audio support
- > Local storage

AXIS Q7401 Video Encoder is a high performance, single channel solution that integrates an analog camera into an IP-based video surveillance system. With outstanding video processing capabilities, AXIS Q7401 delivers superb video quality and significant savings in bandwidth and storage.

AXIS Q7401 offers the highly efficient H.264 video compression, which drastically reduces bandwidth and storage requirements without compromising image quality. Motion JPEG is also supported for increased flexibility.

AXIS Q7401 can deliver multiple, individually configurable video streams simultaneously at full frame rate in all resolutions up to D1 (720x480 in NTSC, 720x576 in PAL). This means that several video streams can be configured with different compression formats, resolutions and frame rates for different needs.

The video encoder also enables users to adjust image settings such as contrast, brightness and saturation to improve images before encoding takes place.

AXIS Q7401 includes intelligent capabilities such as enhanced video motion detection, active tampering alarm and audio detection. The encoder's external inputs and outputs can be connected to devices such as sensors and relays, enabling the system to react to alarms and activate lights or open/close doors.

Support for Power over Ethernet (IEEE802.3af) enables the unit, as well as the analog camera that is connected to it, to receive power through the same cable as for data transmission. This makes for easy installation since no power outlet is needed.

AXIS Q7401 also supports two-way audio and has an SD/SDHC memory card slot for local storage.

46609/EN/R1/1202

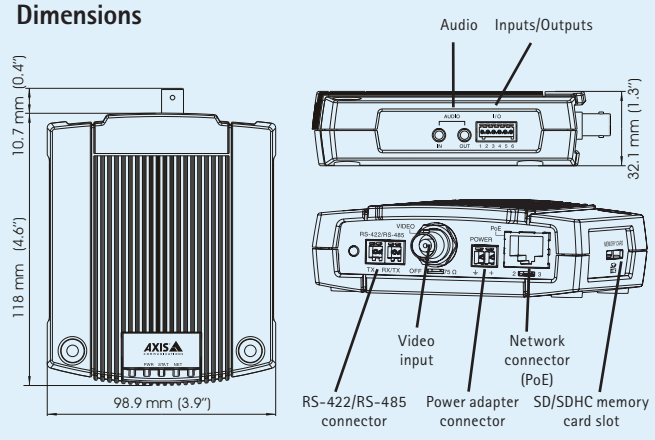
Technical specifications – AXIS Q7401 Video Encoder

Video encoder	
Video compression	H.264 (MPEG-4 Part 10/AVC) Motion JPEG
Resolutions	176x120 to 720x576
Frame rate H.264	30/25 (NTSC/PAL) fps in all resolutions
Frame rate Motion JPEG	30/25 (NTSC/PAL) fps in all resolutions
Video streaming	Multi-stream H.264 and Motion JPEG: 3 simultaneous, individually configured streams in max. resolution at 30/25 fps; more streams if identical or limited in frame rate/resolution Controllable frame rate and bandwidth VBR/CBR H.264
Image settings	Compression, color, brightness, contrast Rotation: 90°, 180°, 270° Aspect ratio correction Mirroring of images Text and image overlay Privacy mask Enhanced deinterlace filter
Pan/Tilt/Zoom	Wide range of analog PTZ cameras supported (drivers available for download at www.axis.com) 100 presets, guard tour, PTZ control queue Supports Windows compatible joysticks
Audio	
Audio streaming	Two way, full duplex
Audio compression	AAC-LC 8 kHz 32 kbit/s, 16 kHz 64 kbit/s G.711 PCM 8 kHz 64 kbit/s G.726 ADPCM 8 kHz 32 or 24 kbit/s
Audio input/ output	External microphone input or line input Line level output
Network	
Security	Password protection, IP address filtering, HTTPS encryption, IEEE 802.1X network access control, digest authentication, user access log
Supported protocols	IPv4/v6, HTTP, HTTPS, QoS layer 3 DiffServ, FTP, SMTP, Bonjour, UPnP, SNMPv1/v2c/v3(MIB-II), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS

System integration	
Application Programming Interface	Open API for software integration, including VAPIX® from Axis Communications available at www.axis.com AXIS Camera Application Platform from Axis Communications; specifications available at www.axis.com Includes the ONVIF specification available at www.onvif.org Support for AXIS Video Hosting System (AVHS) with One-Click Camera connection
Intelligent video	Video motion detection, active tampering alarm, audio detection Support for AXIS Camera Application Platform enabling installation of additional applications
Alarm triggers	Intelligent video, external inputs, video loss, disk full
Alarm events	File upload via FTP, HTTP and email Notification via email, HTTP and TCP External output activation PTZ presets Local storage
Video buffer	64 MB pre- and post-alarm
General	
Casing	Metal casing. Standalone or wall mount
Processor and memory	ARTPEC-3, 128 MB RAM, 128 MB Flash
Power	8-20 V DC, max. 7.2 W or Power over Ethernet IEEE 802.3af Class 2/3
Connectors	Analog composite video BNC input, NTSC/PAL auto-sensing RJ-45 10BaseT/100BaseTX PoE DC terminal block: power in 8-20 V DC, max. 7.2 W or power out 12 V DC, max. 5 W I/O terminal block for four configurable inputs/outputs 3.5 mm mic/line in, 3.5 mm line out RS-485/ RS-422
Local storage	SD/SDHC memory card slot (Card is not included)
Operating conditions	0 °C – 50 °C (32 °F – 122 °F) Humidity 20-80% RH (non-condensing)
Approvals	EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, EN 55024, EN 61000-6-1, EN 61000-6-2, FCC Part 15 Subpart B Class B, ICES-003 Class B, VCCI Class B, C-tick AS/NZS CISPR 22, EN 60950-1 Power supply PS-T: EN 60950-1, CSA, C/US Power supply PS-K: EN 60950-1, UL, cUL
Weight	335 g (0.7 lb.)
Included accessories	Power supply, mounting and connector kits, Installation Guide, CD with installation and management tools, software and User's Manual, 1 Windows decoder user license

More information is available at www.axis.com

Dimensions



Optional accessories

AXIS T8310
Video Surveillance Control Board

Power over Ethernet midspan

AXIS T91A02
DIN Rail Clip 77mm

For information on AXIS Camera Station and video management software from Axis' Application Development Partners, see www.axis.com/products/video/software/

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SUCCESS STORY

Axis video servers help build wireless monitoring system for city fire prevention department.

Organization:
Fire Prevention Center and Shenzhen Xiyi Technology

Location:
Shen Zhen, China

Industry segment:
Government

Application:
Live transmission of real-time conditions at fire-fighting sites

Mission

Fire may happen anytime and anywhere. So to be able to know the fire conditions on site and give corresponding solutions timely, the officers of the Fire Prevention Center hope to find a flexible and mobile video solutions.

Solution

With more than 140 pieces of AXIS 250S Video Server scattered throughout each Fire Prevention Base in Shen Zhen, the Fire Prevention Center can now receive first-rate video images streaming live from the fire-fighting site. The general commander can now give quicker and rational feedbacks to the fire site.

Result

With high quality video and audio transmitted from the fire site back to the Fire Prevention Center, the information can be easily stored in the hard disk of the computer in real time. This provides valuable information for future investigation and analysis.

Customer

Shenzhen Xiyi Technology started out as an IT company, specializing in digital surveillance. Due to the arising trends in digital surveillance in the recent years, they have developed into a products and solution company.

AXIS COMMUNICATIONS

30710/EN/E2/0802

"Even in a very harsh environment, Axis video server can still provide us excellent video sequencing images. Its compact and small size gives us great convenience, mobility and flexibility."

Neil Gong, Technical Manager of ShenZhen Xiyi Technology.

Remote monitoring disaster conditions

As we all know, fire misfortunes cases cannot be forecasted in advance. But once it happens, the fire-fighters have to be dispatched to the site immediately, and the contingent support group should join them at a continuous interval. To realize this purpose, the Fire Prevention Center got some of their fire-fighters to attach the AXIS 250S Video Server and Xinyi's tiny cameras wirelessly onto their helmet. This will allow the Fire Prevention Center to know the conditions in real time and the general commander can now give quicker and rational feedbacks to the fire site.

New applications with Axis video server

With the combinations of the AXIS 250S Video Server and Xiyi's wireless products, new applications have arisen. Now you can take the AXIS 250S Video Server and Xiyi's tiny cameras with you wherever you go. And you can always send the video images to any destinations through wireless microwave network or WLAN. If the distance is far away, the transmission problem still can be solved by microwave connection technology. Thus, a set of mobile and flexible wireless video solution is born.

Complete solutions

With the advancement in technology, there is a paradigm shift from equipment selling to solutions selling. Therefore the combination of many cameras, video servers and wireless transportation equipments, result in a complete customer, equipment and access control management solution, which ensures that the whole monitoring system is fully utilized, secured and reliable.

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AXIS® COMMUNICATIONS

AXIS Camera Station

Un completo software de gestión de vídeo para la supervisión, grabación, reproducción y gestión de eventos.

- > Hasta 100 cámaras
- > Grabación programada y controlada por eventos
- > Fácil instalación
- > Manejo intuitivo
- > Control de cámaras PTZ y domo
- > Planos
- > Visualización y control remoto

AXIS Camera Station es un completo sistema de supervisión y grabación para hasta 100 cámaras. Diseñado para los productos de vídeo en red de Axis, este software ofrece una fácil instalación y configuración con detección automática de cámaras, configuración de múltiples dispositivos y un potente asistente de configuración de eventos.

Vea y grabe vídeo y audio de alta calidad de hasta 100 cámaras con compresión de vídeo H.264, MPEG-4 y Motion JPEG. La compatibilidad con la compresión de vídeo H.264 facilita la optimización del ancho de banda y la eficiencia de almacenamiento al reducir significativamente la tasa de bits sin comprometer la calidad de imagen.

Las grabaciones programadas y controladas por eventos se activan por movimiento o entradas externas. AXIS Camera Station utiliza la detección de movimiento basada en la cámara para ahorrar ancho de banda y espacio en disco. La grabación manual se puede activar directamente en la interfaz de visualización en vivo.

Potente función de búsqueda con visualización cronológica de grabaciones y función de exportación. La compatibilidad con Planos permite captar una visión panorámica de la zona supervisada, así como obtener un acceso ràpido a cualquier cámara de red Axis que haya en la instalación.

La interfaz de usuario se ha desarrollado para ofrecer un manejo intuitivo y sencillo con herramientas de navegación que facilitan el acceso rápido a las cámaras y grabaciones del sistema.

El control de las cámaras PTZ y domo con un joystick o ratón ofrece un control sensible y preciso de la función de movimiento horizontal, vertical y zoom. La compatibilidad con el control PTZ digital está disponible tanto en la visualización en vivo como en la reproducción.

El cliente Windows se puede instalar en cualquier ordenador, para permitir la visualización y el control remoto desde cualquier parte a través de la red corporativa o de Internet.

44715/ES/R1/1110

Especificaciones técnicas – AXIS Camera Station

Cámara	
Modelos	Compatible con los productos de vídeo en red de Axis que ejecutan el firmware 4.30 ó superior
Número de canales	Hasta 100

Vídeo	
Compresión de vídeo	H.264 (MPEG-4 Parte 10/AVC) MPEG-4 Parte 2 Motion JPEG
Resoluciones	Compatible con las resoluciones de los productos de vídeo Axis conectados
Velocidad de grabación	3000 ips o más con el hardware recomendado

Audio	
Transmisión de audio	Audio unidireccional
Compresión de audio	AAC G.711 G.726

Servidor de grabación	
Seguridad	Múltiples niveles de acceso de usuario con protección por contraseña utilizando usuarios de dominios locales o Windows (servicio Active Directory)
Instalación y configuración	Detección automática de cámaras Configuración de múltiples dispositivos Potente asistente de configuración de eventos
Almacenamiento de las grabaciones	Base de datos de grabación limitada sólo por el espacio en disco Grabación directa en discos locales y de red La duración por cámara puede estar limitada para cumplir los requisitos legales locales Grabación de fallos en las cámaras Bloqueo de grabaciones prioritarias
Cliente	Cliente de AXIS Camera Station (para Windows) incluido para la visualización, reproducción y administración local y remota

Visualización en directo	
Visualización en directo	Configuración flexible con visión en vivo para hasta 50 cámaras, Axis' Corridor Format™, múltiples monitores Secuencia de cámara/visión, visión de planos
Compatibilidad con PTZ	Control de cámaras PTZ y domo mediante la utilización de un ratón o joystick Zoom de área Control PTZ digital en visualización en vivo y reproducción
Mejora de la imagen	Calidad mejorada del vídeo en vivo y grabado en condiciones desafiantes como nieve y niebla

Reproducción	
Búsqueda de grabaciones	Se pueden buscar grabaciones a partir de la fecha y la hora Visualización cronológica, búsqueda inteligente, marcadores
Reproducción	Velocidad de reproducción: hasta 64x o frame a frame Gráfico cronológico para facilitar la visión completa de los eventos
Reproducción sincronizada	Reproducción o vídeo y audio para hasta 25 cámaras
Exportación	Exportación manual y programada Imágenes individuales en formato JPEG o secuencias de vídeo en formato ASF Firma digital en grabaciones exportadas Reproductor independiente

Activadores y eventos	
Grabación de eventos	Eventos activados por detección de movimientos, Alarma por manipulación (Active Tampering Alarm), AXIS Cross Line Detection, entradas externas, activación manual o por activaciones de sistema, alarmas del sistema y alarmas del dispositivo
Grabación programada	La programación por cámara permite personalizar las grabaciones de días laborables y fines de semana
Detección de movimiento	Detección de movimiento avanzada basada en la cámara para reducir el uso de ancho de banda
Control de entrada/salida	Control avanzado de las entradas/salidas digitales de las cámaras
Notificación de alarma	Indicación visual, alerta sonora, notificación en bandeja de sistema, conmutador de cámara/visión, ir a PTZ predefinida, procedimiento de alarmas por correo electrónico, reconocimiento de alarmas
Registros	Registros de alarmas, eventos y auditoría Todos los eventos se pueden filtrar por día, hora y/o cámara

Sistema	
Requisitos mínimos del sistema	Windows 7 Professional, Vista Business, XP Professional (servidores y/o clientes), 2008 Server R2, 2008 Server, 2003 Server (solo servidor, 64 bit OS recomendado para sistemas más grandes) Utilice siempre los paquetes de servicio más recientes Entorno de tiempo de ejecución Microsoft .NET (incluido en el paquete de instalación)
Requisitos informáticos mínimos del cliente	CPU: Intel P4 o superior, 2 GHz (Intel Core i7 recomendado para grandes sistemas) RAM: 1 GB (4 GB recomendado para grandes sistemas) Tarjeta gráfica con aceleración de hardware DirectX 9.0 completa y memoria de vídeo integrada de 256 MB o superior ¡Importante! Utiliza el último driver para tarjeta de vídeo y DirectX runtime
Requisitos informáticos mínimos del servidor	CPU: Intel P4 o superior, 2 GHz (Intel Xeon recomendado para grandes sistemas) 1 GB de RAM (8 GB recomendado para grandes sistemas)
Red recomendada	Red de 100 Megabits (red Gigabit recomendada para grandes sistemas)
Configuración de disco duro recomendada	A 30 ips en VGA: hasta 15 cámaras por disco duro

General	
Idiomas	Inglés, francés, italiano, alemán, español, polaco, ruso, coreano, japonés, chino, sueco, danés, turco, árabe y persa
Licencias	Licencias básicas de AXIS Camera Station para 4 ó 10 cámaras/canales para su uso en un único PC/servidor dedicado Licencias adicionales para +1, +5 ó +20 y hasta 100 cámaras/canales Licencia de soporte de un año incluida en la licencia básica 4/10 La asistencia y las actualizaciones futuras requieren una licencia de soporte anual La versión de prueba de 30 días se puede actualizar a una versión con licencia
Registro de licencia	Puede registrarse automáticamente a través de Internet, o manualmente en www.axis.com en el periodo de gracia de cinco días
Accesorios incluidos	Guía de instalación CD con software y manual de usuario

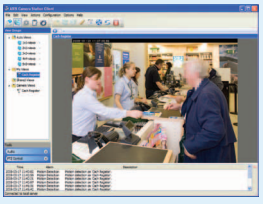
Más información disponible en www.axis.com

Accesorios opcionales

Cuadro de control para videovigilancia AXIS T8310 para un control preciso de las cámaras pan/tilt/zoom

Módulo de audio con E/S AXIS P8221 mejora los sistemas de vigilancia por vídeo con E/S adicional y una calidad de audio excelente

AXIS Camera Station One – gratuito



Solución de software para visualizar y grabar vídeo en vivo procedente de una única cámara de red Axis

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AXIS COMMUNICATIONS

AXIS 2460 Network DVR

Vídeo digital. Grabación a escala local. Visionado a escala global

Sofisticado, y a la vez de una brillante sencillez, el AXIS 2460 Network DVR sitúa la grabación de vídeo digital en un nivel de adelanto técnico completamente nuevo. Conéctelo directamente a una red TCP/IP y acceda a distancia a toda una serie de herramientas de administración de sistemas y vídeo digital, utilizando un navegador web estándar. Admite hasta cuatro cámaras analógicas, dispone de su propio servidor web incorporado y no requiere ningún tipo de mantenimiento externo. ¡Sin necesidad de cintas, enredos ni costosas piezas móviles!

Con su capacidad para conservar las secuencias importantes de vídeo durante períodos de tiempo más prolongados que cualquier otra solución de grabación de vídeo digital, el AXIS 2460 proporciona un recurso de grabación local practicamente inagotable para la videovigilancia, utilizando la revolucionaria tecnología* APViS™ (Axis Prioritized Video Storage –almacenamiento priorizado de vídeo de Axis–).

Utilizado como un sistema independiente único, en pequeños negocios, o como un componente autónomo, dentro de un sistema de videovigilancia distribuida a escala global, el AXIS 2460 es la solución perfecta para uso en grandes cadenas de establecimientos minoristas, franquicias o cualquier negocio que requiera un cómodo acceso a imágenes de videovigilancia, en directo o grabadas.

**Pendiente de concesión de patente*

- Almacena las secuencias importantes de vídeo durante más tiempo, utilizando la revolucionaria tecnología APViS
- Sistema tolerante a los fallos, con duplicación simultánea de las bases de datos y almacenamiento distribuido de las imágenes de vídeo
- Sistema completo y libre de mantenimiento
- Funcionalidad de cortafuegos incorporada
- Visionado, grabación, reproducción y administración simultáneas a través de un navegador web
- Diseñada para redes

AXIS® COMMUNICATIONS

Tecnología innovadora APViS™

Almacena las secuencias importantes de vídeo más tiempo

Las grabaciones de vídeo más antiguas pueden contener pruebas visuales de una importancia vital. Cuando el disco duro de cualquier DVR convencional se llena, son simplemente las grabaciones más antiguas las que se borran de forma indiscriminada, con objeto de dejar espacio libre para las grabaciones nuevas. Se trata de la lógica FIFO estándar. La primera imagen grabada (First In) es la primera imagen que se borra (First Out). ¿Es esa realmente la forma más inteligente de gestionar un sistema moderno de videovigilancia?

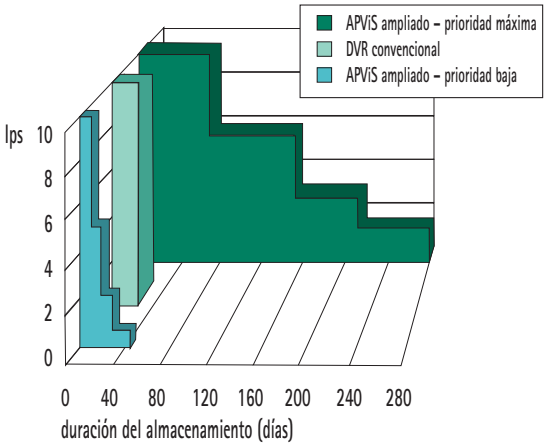
Mediante la utilización de la innovadora tecnología APViS, el AXIS 2460 Network DVR hace un uso más eficiente del valioso espacio libre existente en el disco, con objeto de conservar las grabaciones de vídeo durante más tiempo. Utilizando de forma inteligente los datos sobre incidentes y alarmas, distingue las secuencias de vídeo "importantes" de las "menos importantes".

Haciendo uso de dicho criterio, el AXIS 2460 es capaz de almacenar las secuencias de vídeo de máxima prioridad, a su velocidad original de grabación, durante un período de tiempo cuatro veces más largo que cualquier solución convencional de almacenamiento, basada en la lógica FIFO –y durante un período de tiempo dieciséis veces más largo, utilizando un sistema de reducción progresiva de la frecuencia de imágenes–. En la práctica, ¡esa puede ser la dramática diferencia que existe entre disponer de pruebas visuales o no disponer de ellas!

Ejemplo

En el siguiente gráfico se ilustran los tiempos típicos de almacenamiento con el modo de grabación APViS "ampliado", frente a los tiempos de almacenamiento "FIFO" convencionales, basándose en la siguiente configuración:

- Frecuencia de imágenes original de la grabación: 10 imágenes por segundo
- Tamaño medio de cada imagen = 8 kB
- 1 cámara
- 4 discos duros IDE de 40 GB
- Grabación continua de baja prioridad y una única grabación de alarma de alta prioridad, de 30 minutos de duración



Vídeo seguro. Almacenamiento seguro

En las aplicaciones de seguridad, la calidad uniforme de las imágenes grabadas tiene una importancia vital. Con tres resoluciones diferentes disponibles para cada cámara conectada, el AXIS 2460 graba las imágenes en formato JPEG-vídeo y garantiza una calidad constante y elevada de todas y cada una de las imágenes.

La utilización, única en su género, de un sistema de duplicación simultánea de las bases de datos y de almacenamiento distribuido de las imágenes de vídeo en todos los discos duros disponibles permite al AXIS 2460 tolerar el posible fallo de un disco duro sin que se produzca una pérdida completa de las grabaciones. La implicación práctica de un fallo de un disco duro queda limitada a una reducción relativa de la frecuencia de imágenes de las grabaciones.

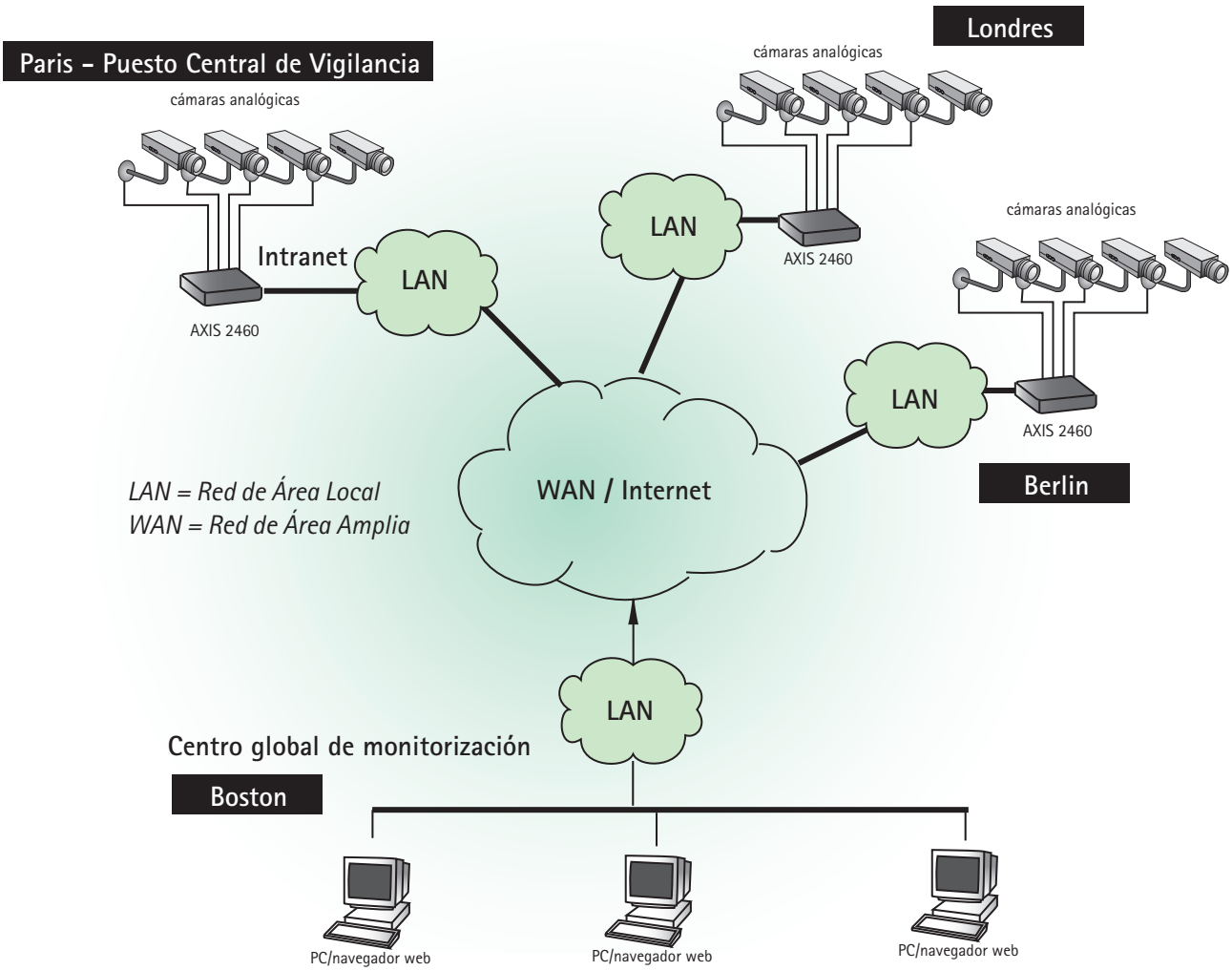
Tres niveles de protección a nivel de usuario, mediante contraseña, con funcionalidad cortafuegos incorporada, para un acceso remoto al sistema a través de redes TCP/IP, con la debida seguridad.

Configuración flexible de la red

Instalación independiente o como componente de un sistema distribuido a escala global

Dado que más del 90% de las grabaciones de vídeo archivadas a menudo ni se visionan, la grabación descentralizada de imágenes de vídeo evita una utilización innecesaria de las redes y resulta muy útil cuando el ancho de banda de la red es limitado.

El AXIS 2460 Network DVR lleva incorporado su propio servidor web, y puede accederse a él de forma segura desde cualquier lugar geográfico, por distante que se encuentre, utilizando para ello el navegador Internet Explorer de Microsoft.
Instalando un único AXIS 2460 en cada lugar, las organizaciones disponen ahora de la oportunidad de establecer un gran sistema de almacenamiento de imágenes de vídeo, distribuido a escala global, que les permitirá visionar y gestionar las citadas imágenes desde cualquier lugar, a través de redes TCP/IP.



Sistema distribuido a escala global, con varios AXIS 2460 Network DVR

Especificaciones técnicas - AXIS 2460 Network DVR

Caracteristicas clave

- Visionado remoto en directo, grabación, reproducción y administración simultáneas a través de un navegador de la web
- Imágenes digitales de calidad elevada y uniforme, que no se deterioran con el paso del tiempo
- Modos de grabación contínuo, de incidentes/alarmas, manual y programado
- Extracción de instantáneas y ficheros AVI al disco duro de un PC o a cualquier soporte digital elegido
- Sistema libre de mantenimiento, que no requiere ninguna intervención física durante el funcionamiento normal del mismo
- Sistema completo, que no requiere ningún componente adicional de software
- Visualización "Quad-View"
- Ajustes de la compresión, la resolución y la frecuencia de imágenes, seleccionables por el usuario
- Notificación de incidentes mediante correo electrónico
- Ajustes del tampón de prealarma y la duración de la grabación

Requisitos del sistema

- Red Ethernet o módem compatible v.90 soportado
- Internet Explorer 5.x ó superior
- Soporta los protocolos TCP/IP estándar para Internet y puede ser utilizada con: Windows 95/98, NT/2000, Me y XP

Sistema

Ethernet 100baseTX Fast ó Ethernet 10baseT

- CPU: procesador RISC de 32 bits ETRAX 100 LX de AXIS
- Memoria flash: 4 MB
- RAM: 32 MB
- Basada en el sistema operativo Linux, versión 2.4
- Se entrega de forma opcional con 0, 2 ó 4 discos duros IDE

Instalación

- Conexión física a la red con un cable par trenzado RJ-45
- Conexión directa a las cámaras de vídeo PAL o NTSC mediante conectores BNC

Actualizaciones del software

- La memoria flash permite la realización centralizada y a distancia de actualizaciones del software a través de la red, utilizando el protocolo FTP sobre el protocolo TCP/IP. Actualizaciones disponibles en el web de Axis: www.axis.com

Mandos e indicatores del panel frontal

Indicadores LED

- 4 indicadores de vídeo, 4 indicadores de activación de alarmas, 1 indicador de alimentación, 1 indicador de estado, 1 indicador de actividad del disco y 1 indicador de actividad de la red

Pulsadores

- 1 pulsador de apagado/encendido

Resolución

- QCIF: 176 x 144 (PAL), 176 x 112 (NTSC)
- CIF: 352 x 288 (PAL), 352 x 240 (NTSC)
- 4CIF: 704 x 576 (PAL), 704 x 480 (NTSC)

Frecuencia de imágenes de la grabación

- 1 cámara: CIF, compresión normal: 25/30 fps (PAL/NTSC)
- 4 cámaras: CIF, compresión normal: 25/30 (PAL/NTSC)*

**Número total de imágenes con cámaras sincronizadas*

Seguridad

- Protección mediante contraseña a nivel de usuario
- El sistema de cortafuegos IP incorporado protege contra el acceso ilícito desde ordenadores no autorizados

Capacidad de almacenamiento

- 80 GB, 160 GB ó la instalada por el integrador del sistema
- Duración del almacenamiento dependiente de los ajustes de la imagen
- La duración de las imágenes CIF almacenadas, según los diferentes modos de grabación y compresión AVPiS de que se dispone, son las indicadas a continuación:

Recording availability at CIF resolution				
Compresión	**Tam. del fichero**	**Normal**	**Ampliado**	**Extralargo**
Alta	8 kB	45 dias	96 dias	253 dias
Normal	13 kB	27 dias	57 dias	149 dias
Baja	17 kB	20 dias	42 dias	110 dias

(Datos basados en un modelo equipado con 4 discos duros de 40 GB, grabando a partir de 4 cámaras a 1 imagen por segundo, procedente de cada una de ellas)

Conexiones

Conector de la red

- Conexión RJ-45 a redes Ethernet de 10/100 Mb

Entradas de vídeo

- 4 entradas de vídeo compuestas, con terminación Hi Z de 75 ohmios
- Detección automática de PAL y NTSC

Conector único de bloque de terminales

- 4 entradas de alarma aisladas ópticamente
- 1 relé de salida

Conector serie

- D-SUB RS-232 de 9 pins, máx. 230 Kbps
- D-SUB RS-232 ó RS-485/422 de 9 pins, máx. 38,4 Kbps, semidúplex

Alimentación

- 50/60 Hz, 115/230V, Max 1A (normalmente 60W)

Condiciones de funcionamiento

- Temperatura: 5 – 40° C
- Humedad: 8 – 80%

Dimensiones y peso

- Dimensiones físicas: 430 x 320 x 100 mm
- Se entrega con soportes para montaje en un bastidor de 48 cm. aprx. (19 pulgadas)
- Peso: sin discos = 7 kg, con 2 discos = 8,2 kg, con 4 discos = 9,4 kg

Aprobaciones

- Compatibilidad electromagnética (EMC)

– CE EN55022 Clase B, EN55024

– FCC Clase A

- Seguridad

– EN 60950, incluida en las listas C-UL

19557/ES/R1/0208

Para más información, visite la página Web: www.axis.com/es

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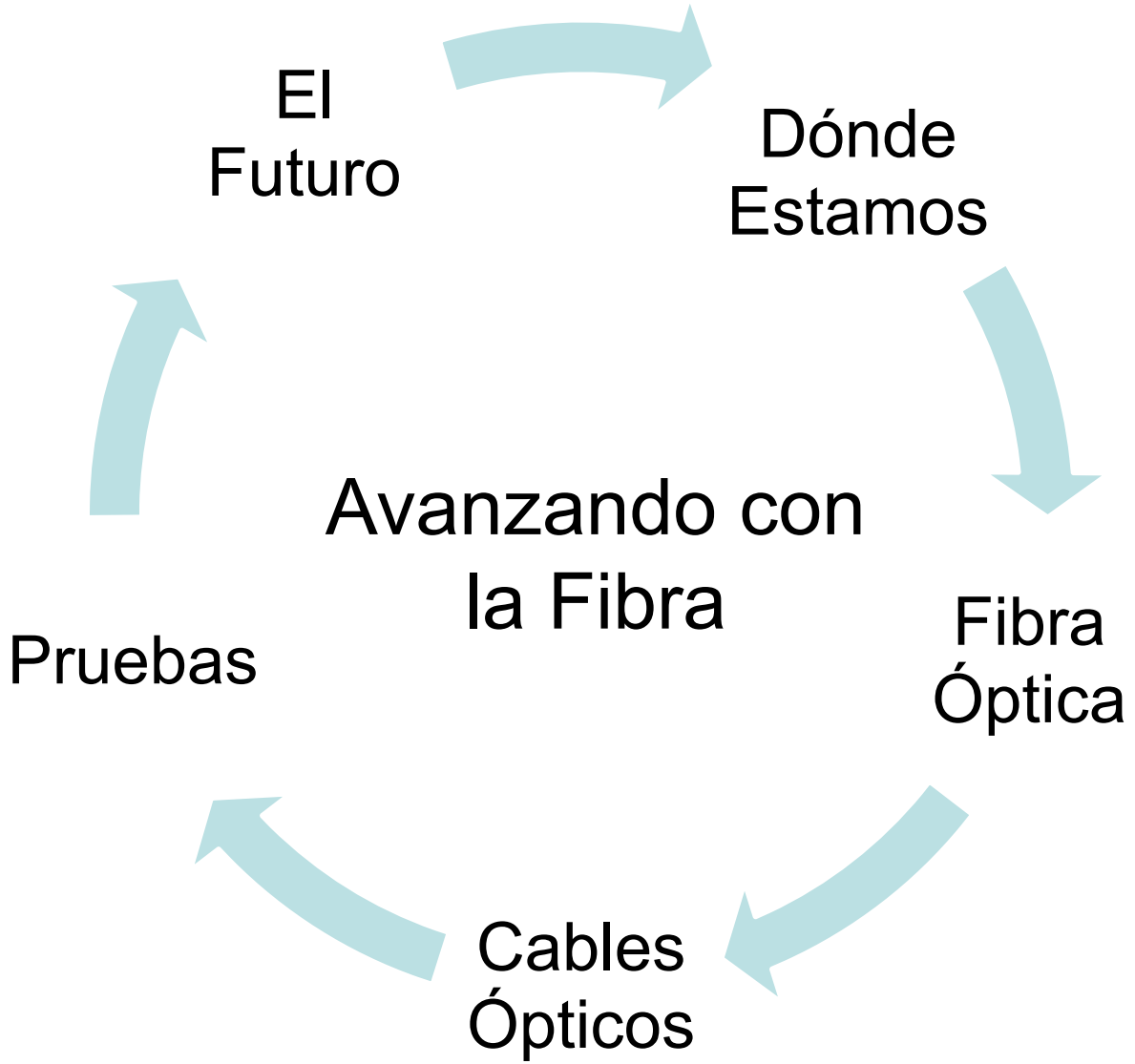
AXIS® COMMUNICATIONS

Helping you build better networks...

BRAND-REX TECHNICAL SEMINAR SERIES 2009

Las Fibras Ópticas del Futuro

Brand-Rex

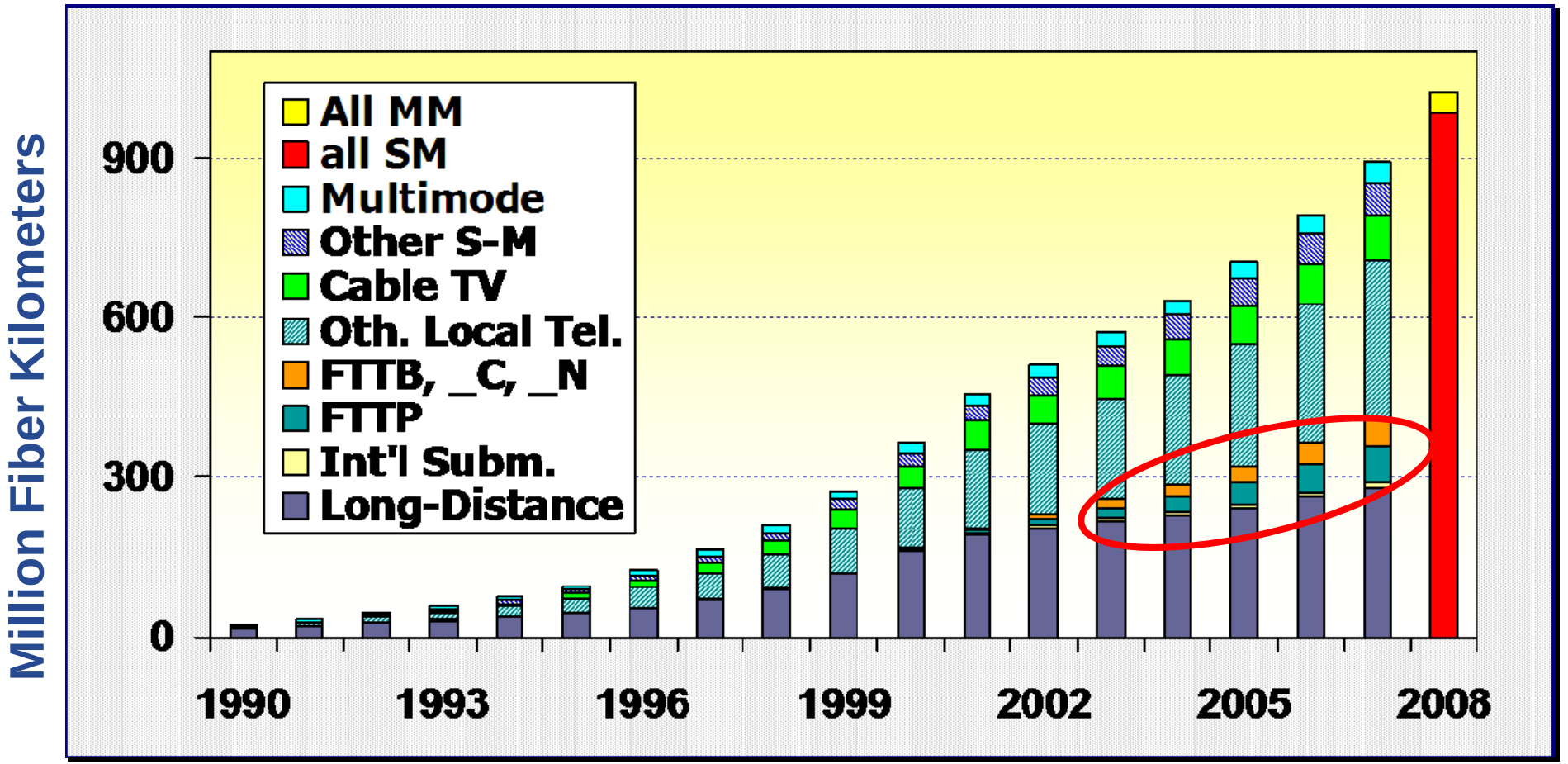

El Futuro
Dónde Estamos
Fibra Óptica
Cables Ópticos
Pruebas
Avanzando con la Fibra

¿Dónde estamos?

Fibra óptica instalada en el mundo

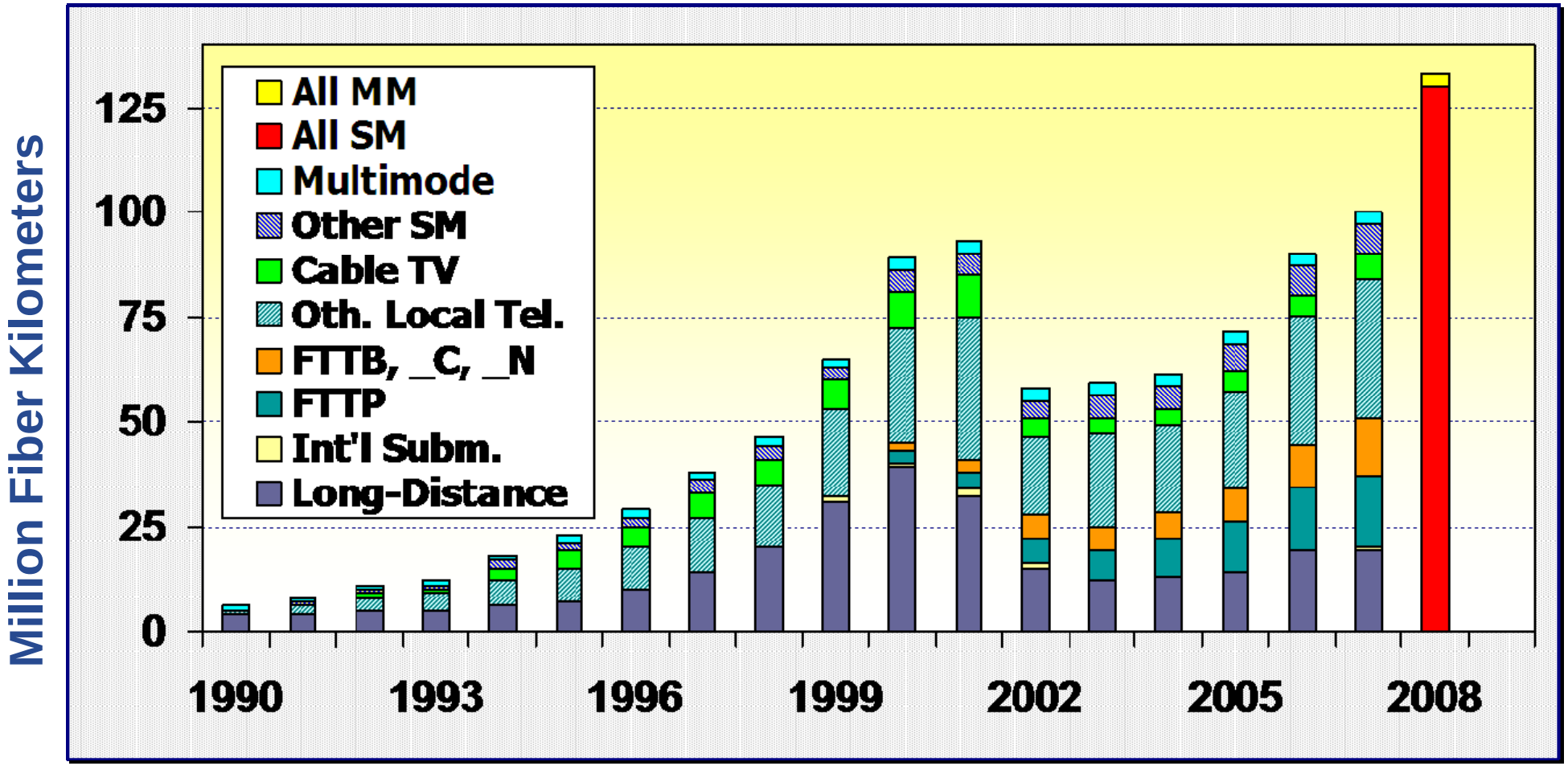
Base de fibra instalada (Global)

Source: KMI Research/ Draka



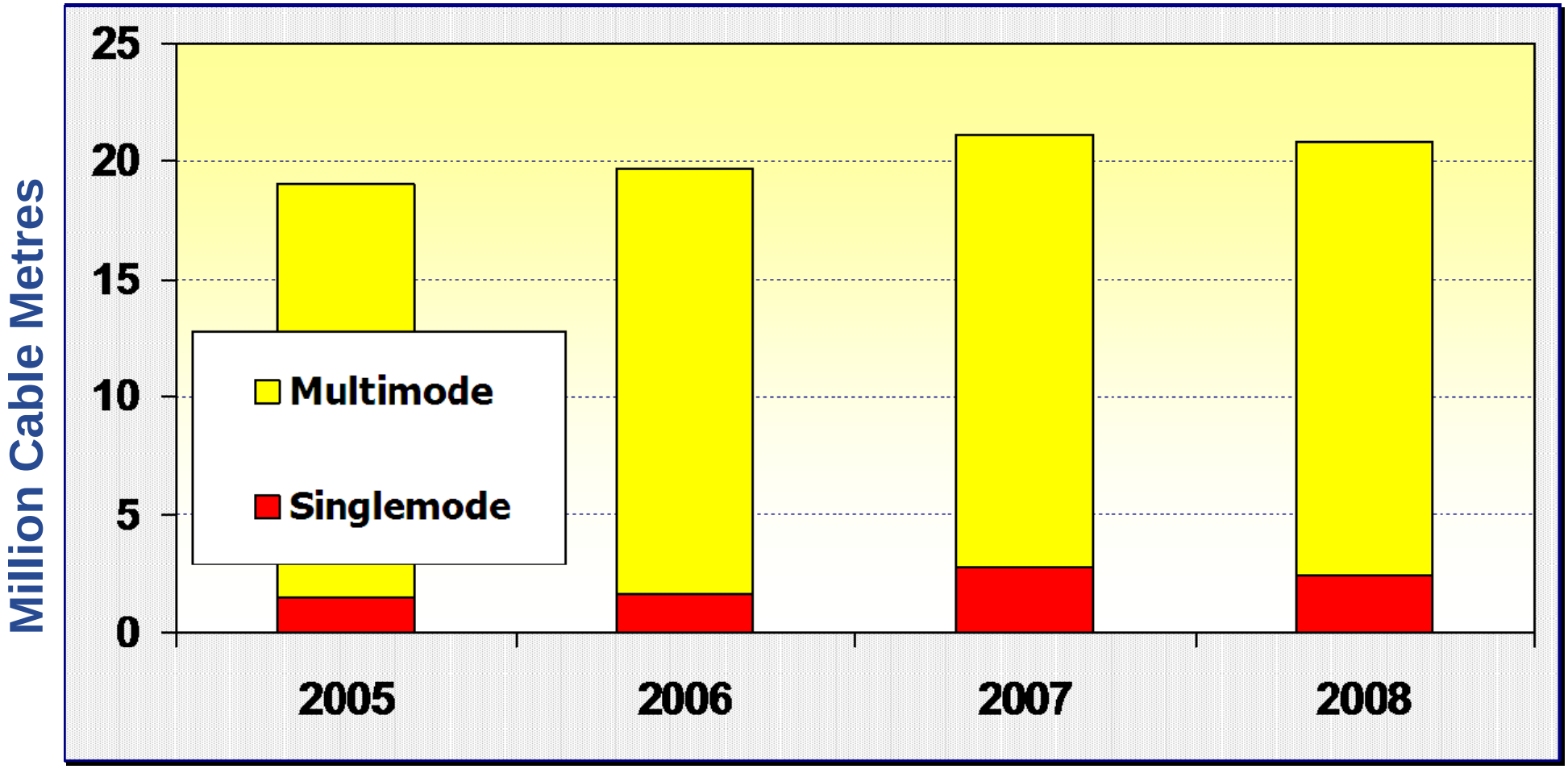
Intalaciones anuales (Global)

Source: KMI Research/Draka



Instalaciones anuales (Cableado Estructurado UK)

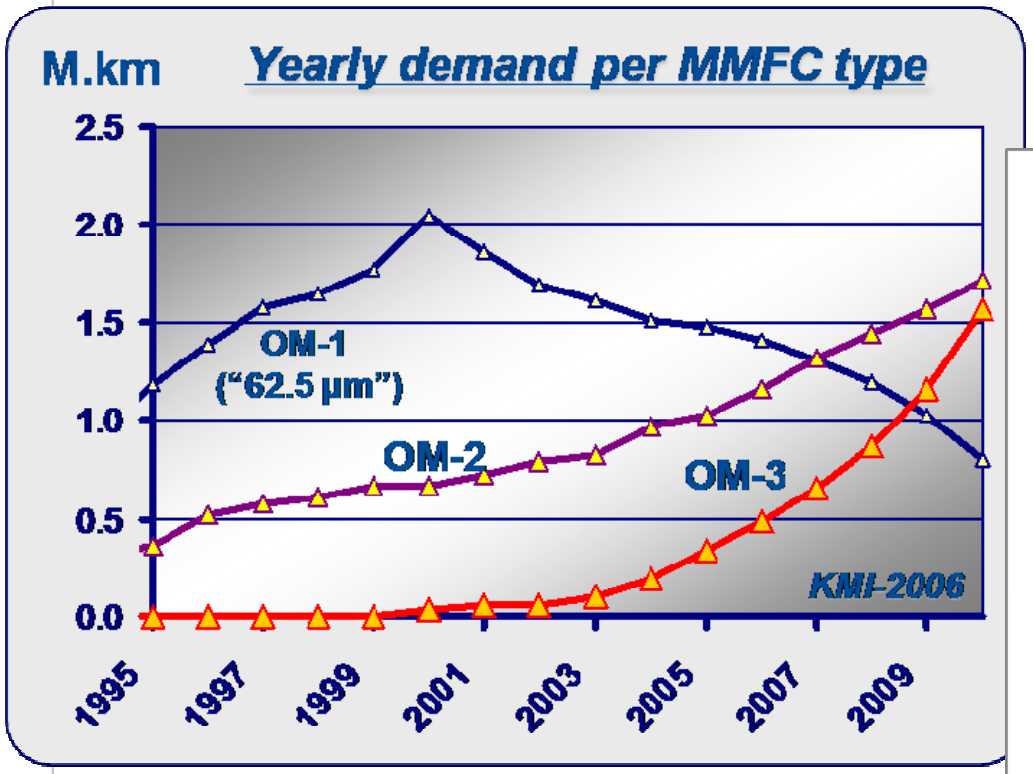
Source: BSRIA

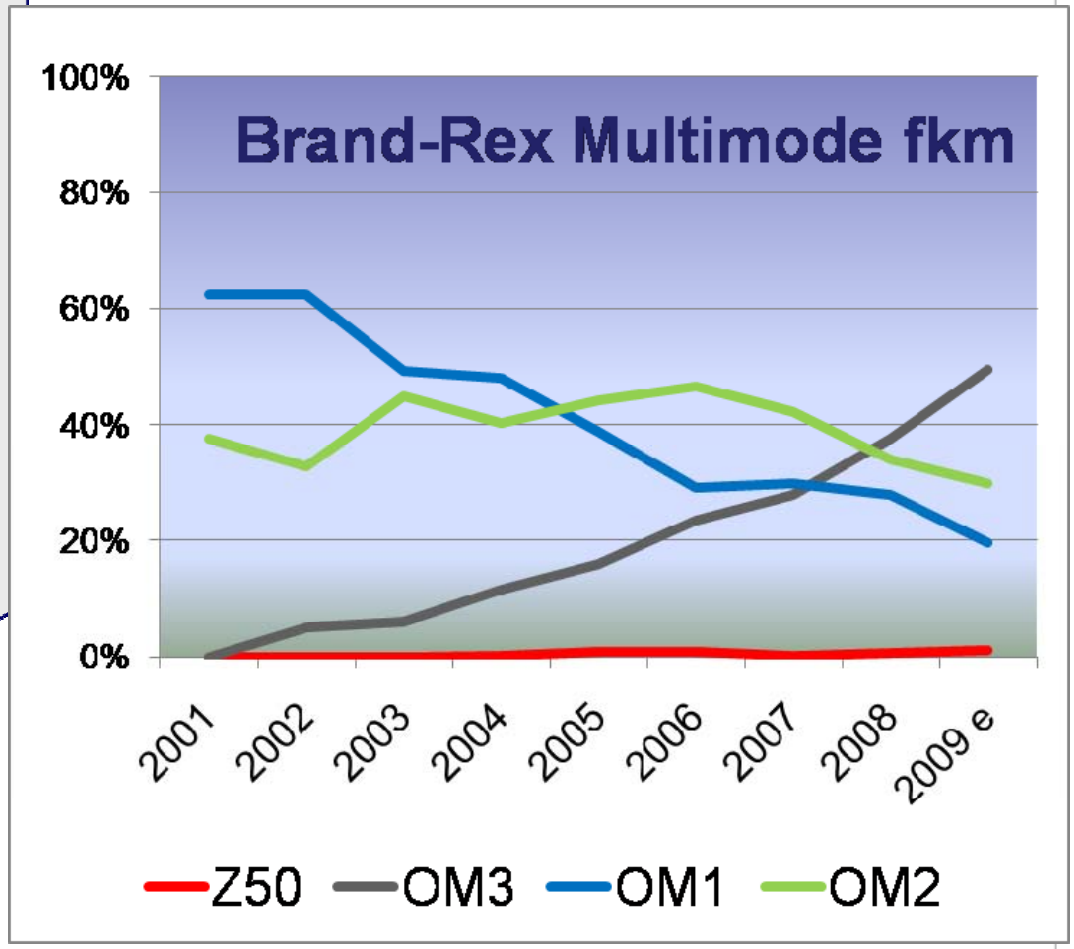


¿Dónde estamos?

Tendencias en fibra Multimodo

Previsiones en fibra Multimodo



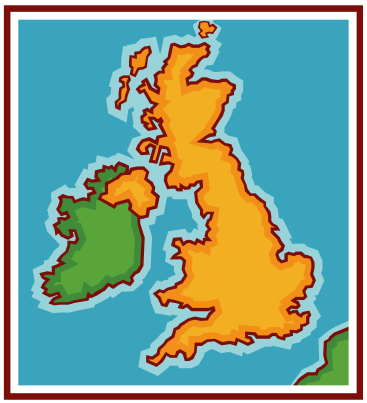


¿Cómo hemos llegado hasta aquí?

Estándares, estándares, estándares…

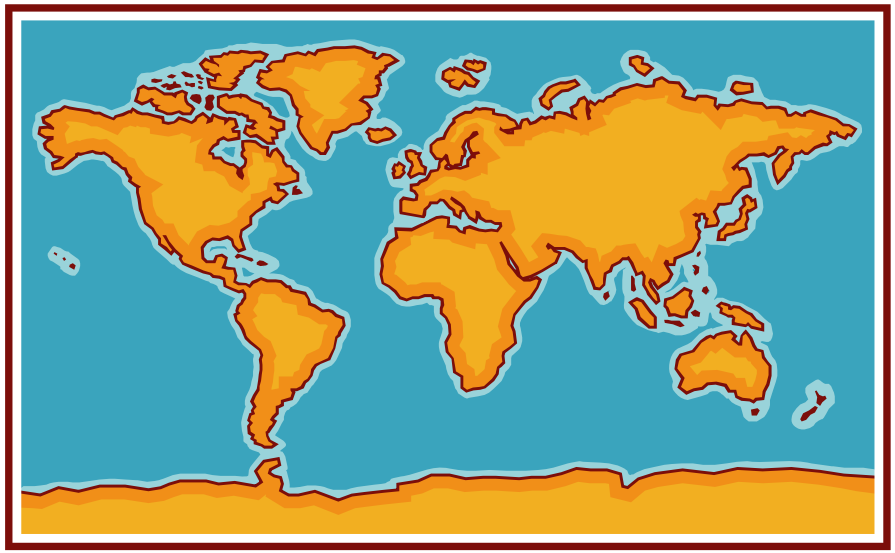
Estándares de Fibra Óptica

Brand-Rex cree firmemente en el valor de los estándares para proporcionar una base sólida para nuestra industria, y participa activamente en 12 grupos de estandarización



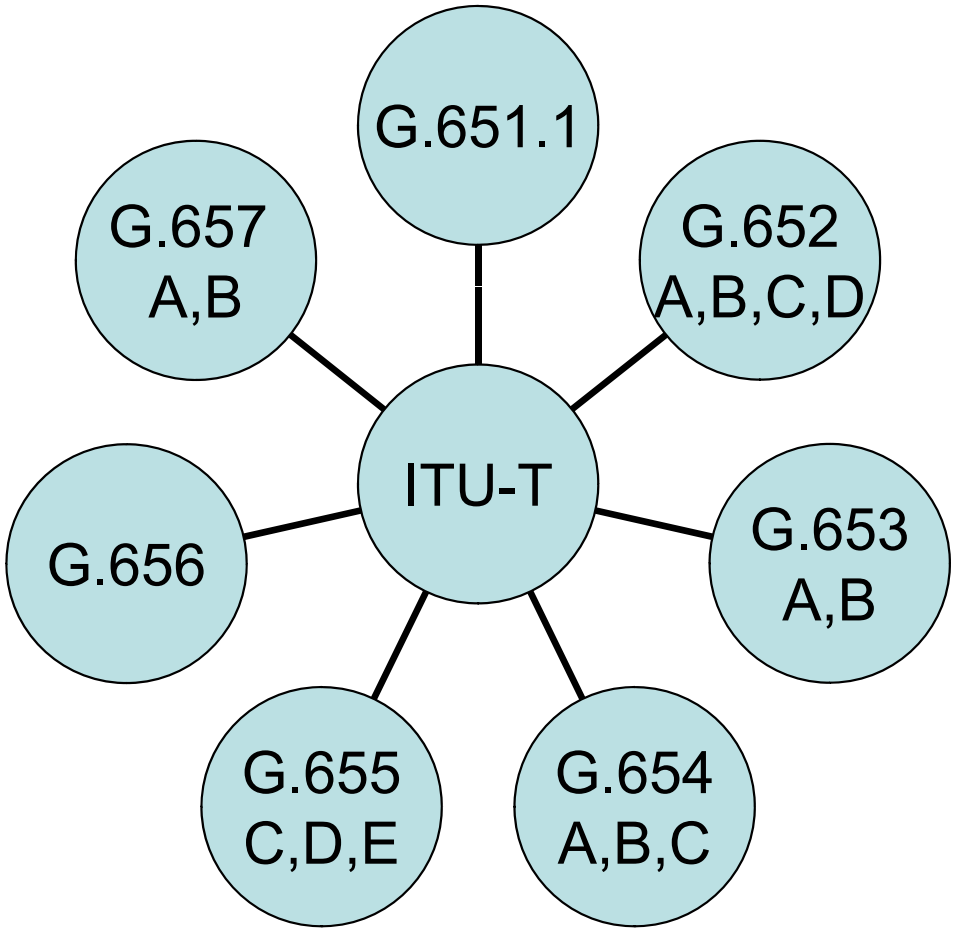
BSI (5)

Cenelec (3)



IEC (4)

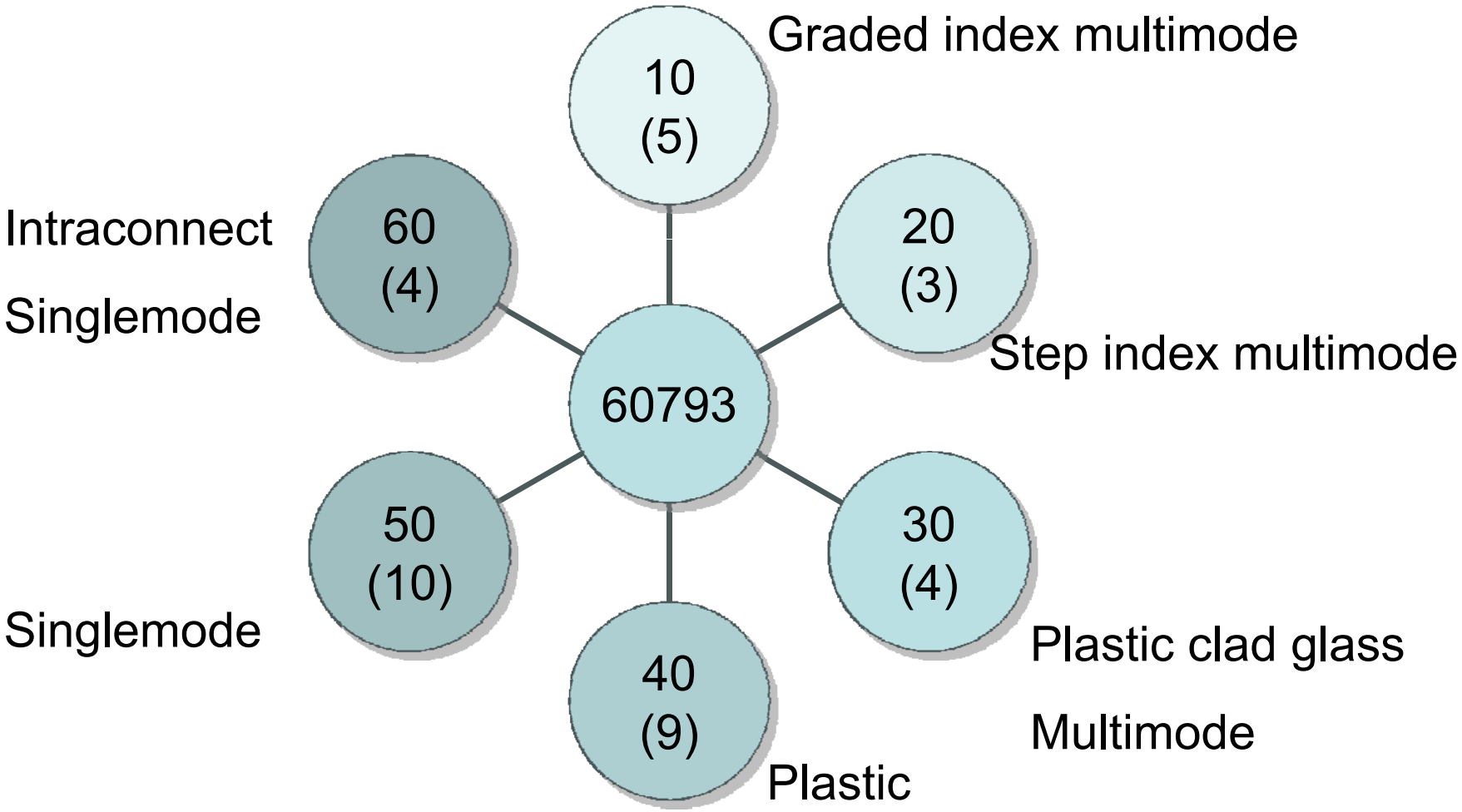
ITU-T Recomendaciones para fibra óptica



ITU-T

International Telecommunication Union - Telecommunication Standardization Sector (www.itu.int)

IEC y Cenelec especificaciones para fibra óptica

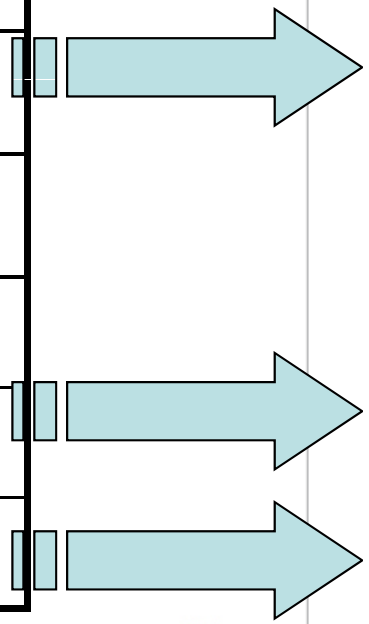


IEC

International Electrotechnical Commission (www.iec.ch)

Fibras ópticas en cableado estructurado

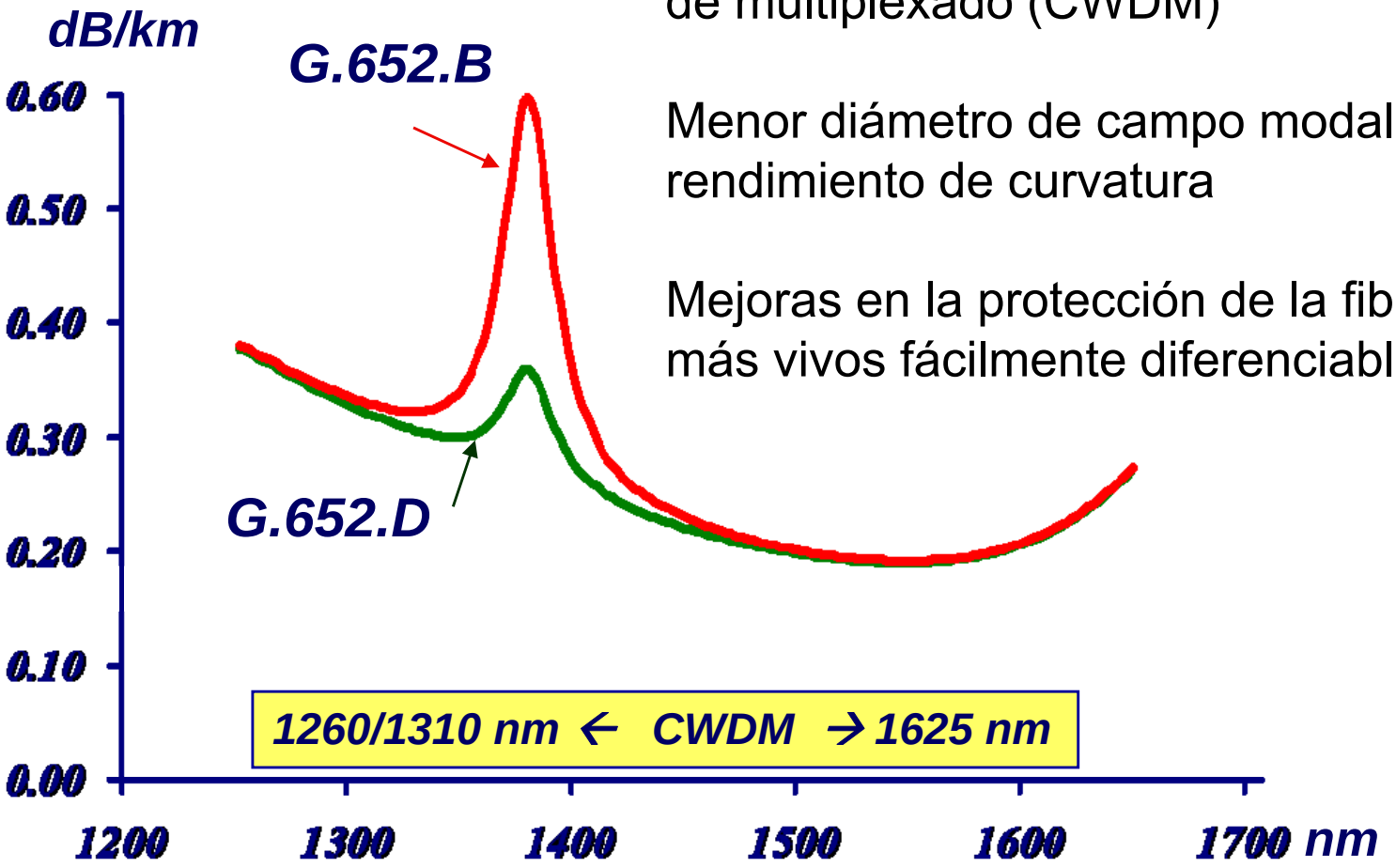
IEC/Cenelec EN 60793 -	ITU-T	Type	Cabled optical fibre	Application
10 - A1a.1	G.651.1	Multimode 50/125	OM2	Access network, GbitE
10 - A1a.2	-	Multimode 50/125	OM3	10GbitE
10 - A1a.3**	-	Multimode 50/125	OM4**	??
10 - A1b	-	Multimode 62.5/125	OM1	GbitE
50 - B1.1	G.652B	Singlemode	OS1	Up to 2km
50 - B1.3*	G.652D	Singlemode	OS1/OS2*	Over 2km
50 - B6_a*	G.657A	Singlemode	OS1/OS2**	??



* Nuevos estándares **en desarrollo

Brand-Rex

Brand-Rex G.652D Low water Peak fibre



Mayor ventana de operación para aplicaciones de multiplexado (CWDM)

Menor diámetro de campo modal para mejorar el rendimiento de curvatura

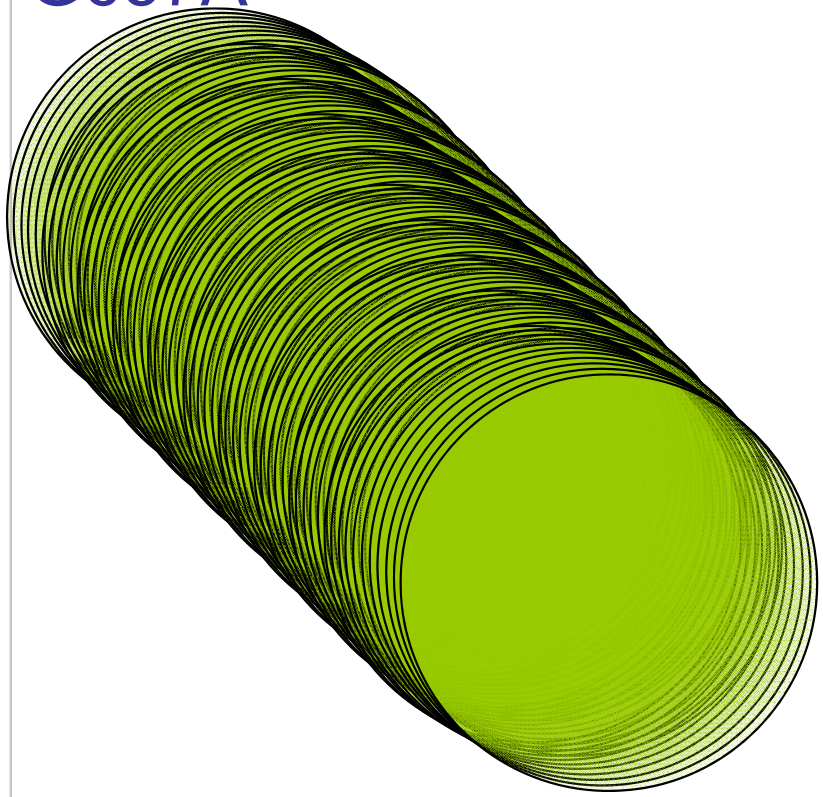
Mejoras en la protección de la fibra, con colores más vivos fácilmente diferenciables

Nueva recomendación ITU-T G.657

ITU-T G.657
SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

Características de fibra monomodo insensible a las pérdidas por curvatura

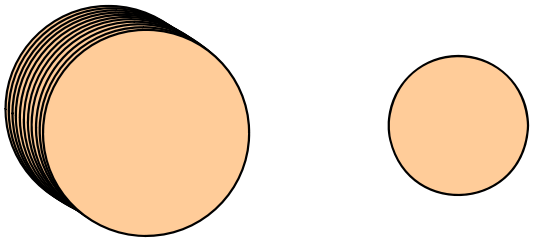
Pérdidas por Macrocurvaturas en G652D comparado con G657A



G.652 D

100 vueltas 60mm diámetro,

1.0 dB a 1625 nm



G.657 A

10 vueltas 30mm diámetro,

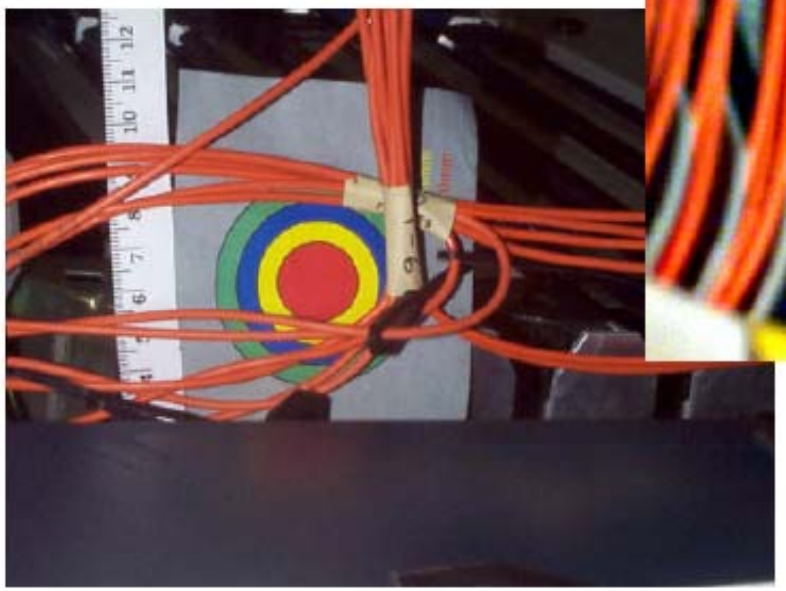
0.25 dB a 1550 nm y 1.0 dB a 1625 nm

1 vuelta 20mm diámetro

0.75 dB a 1550 nm y 1.5 dB a 1625 nm

Una aplicación clave para G.657A son los latiguillos en espacios estrechos, para evitar las pérdidas causadas por curvas cerradas accidentales

Examples of poor patch cord management in a 'typical' exchange in a mature network.



Curvas cerradas y láser de alta potencia

- Las nuevas aplicaciones de telecomunicación utilizarán amplificadores Raman con potencias típicas de 500mW a ~ 2W
- Para curvas menores de15mm de diámetro, se puede dañar la fibra G652D
- Los daños pueden ser envejecimiento del revestimiento, oxidación o quemado del revestimiento, y en casos extremos fusión del cristal.

Opciones para limitar los daños potenciales a las fibras

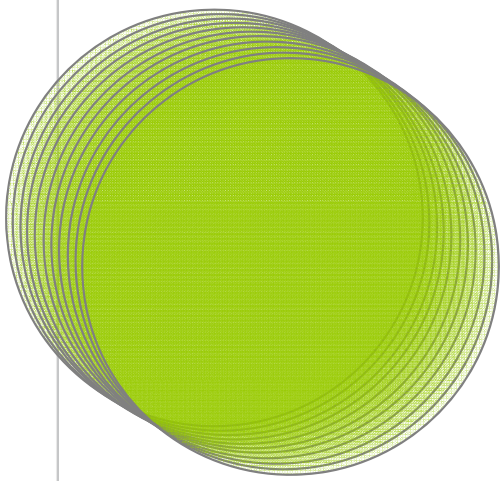
- Limitar la potencia óptica
- Mejorar la manipulación y gestión de los latiguillos
- Mejorar la tecnología en las fibras potencialmente en riesgo

Promovido por BT a través de ITU-T e IEC en los dos últimos años

IEC TR 62547 Guidelines for the measurement of high-power damage sensitivity of singlemode fibres to bends – Guidance for the interpretation of results

Publicado por IEC en 2009

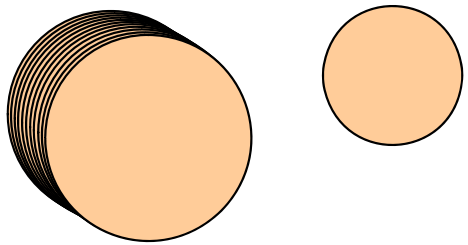
Pérdidas por Macrocurvaturas en G652D, G657A y G657B



G.652 D

100 vueltas 60mm diámetro,

1.0 dB a 1625 nm



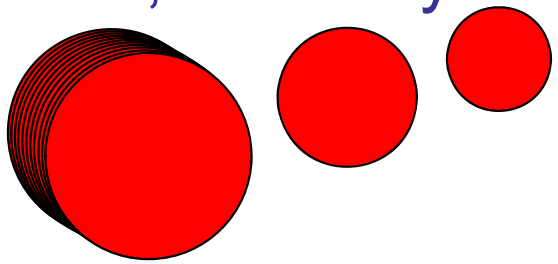
G.657 A

10 vueltas 30mm diámetro,

0.25 dB a 1550 nm y
1.0 dB a 1625 nm

1 vuelta 20mm diámetro

0.75 dB a 1550 nm y
1.5 dB a 1625 nm



G.657 B

10 vueltas 30mm diámetro

0.03 dB a 1550 nm y
0.1 dB a 1625 nm

1 vuelta 20mm diámetro

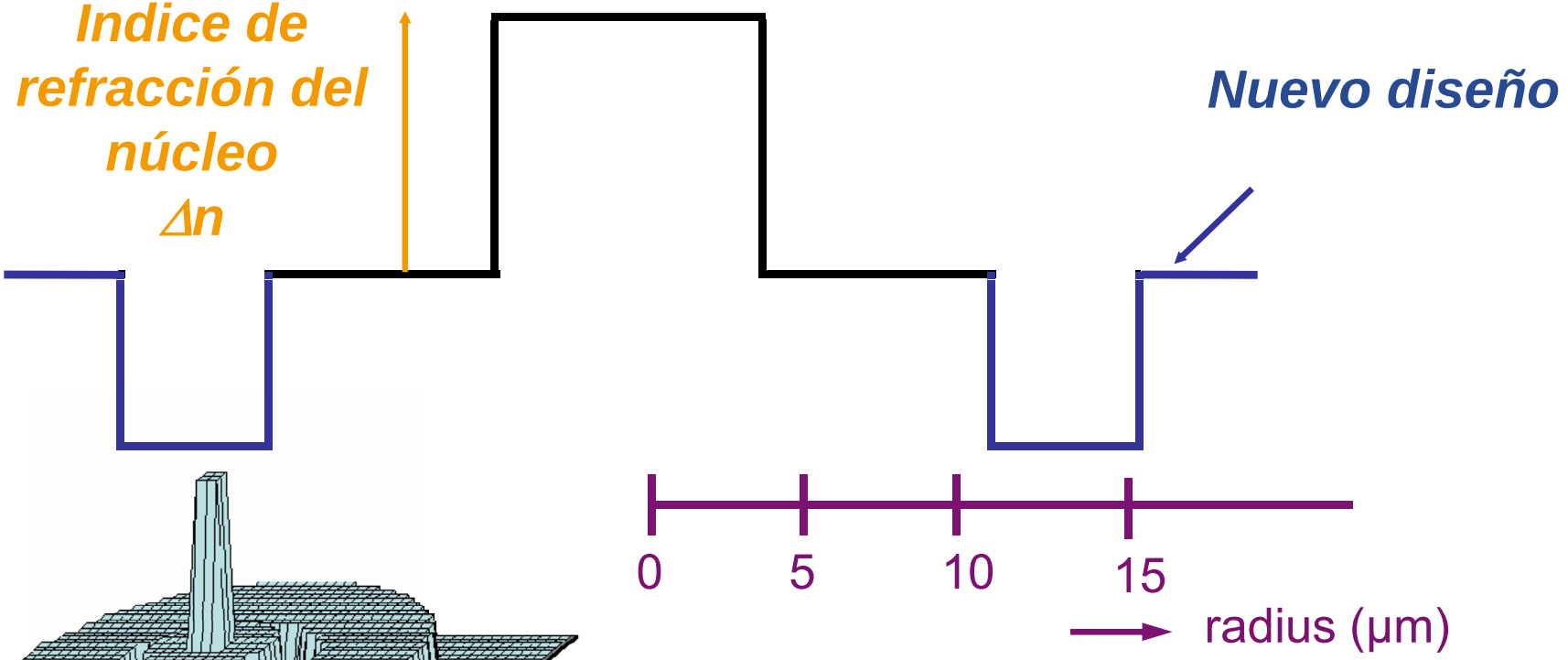
0.1 dB a 1550 nm y
0.2 dB a 1625 nm

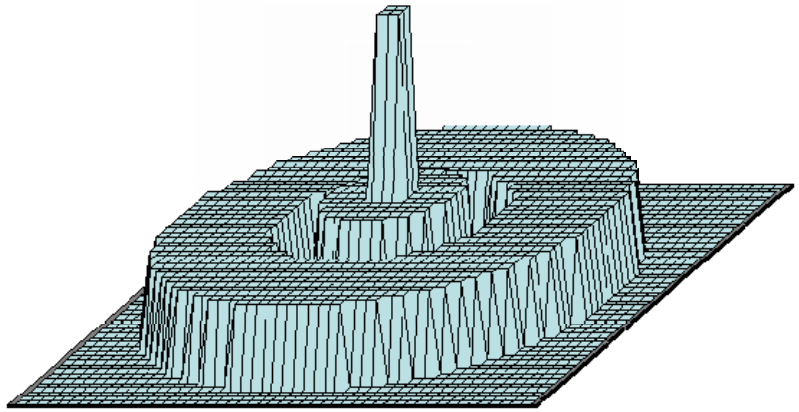
1 vuelta 15 mm diámetro

0.5 dB a 1550 nm y
1.0 dB a 1625 nm

Nueva fibra monomodo G.657B

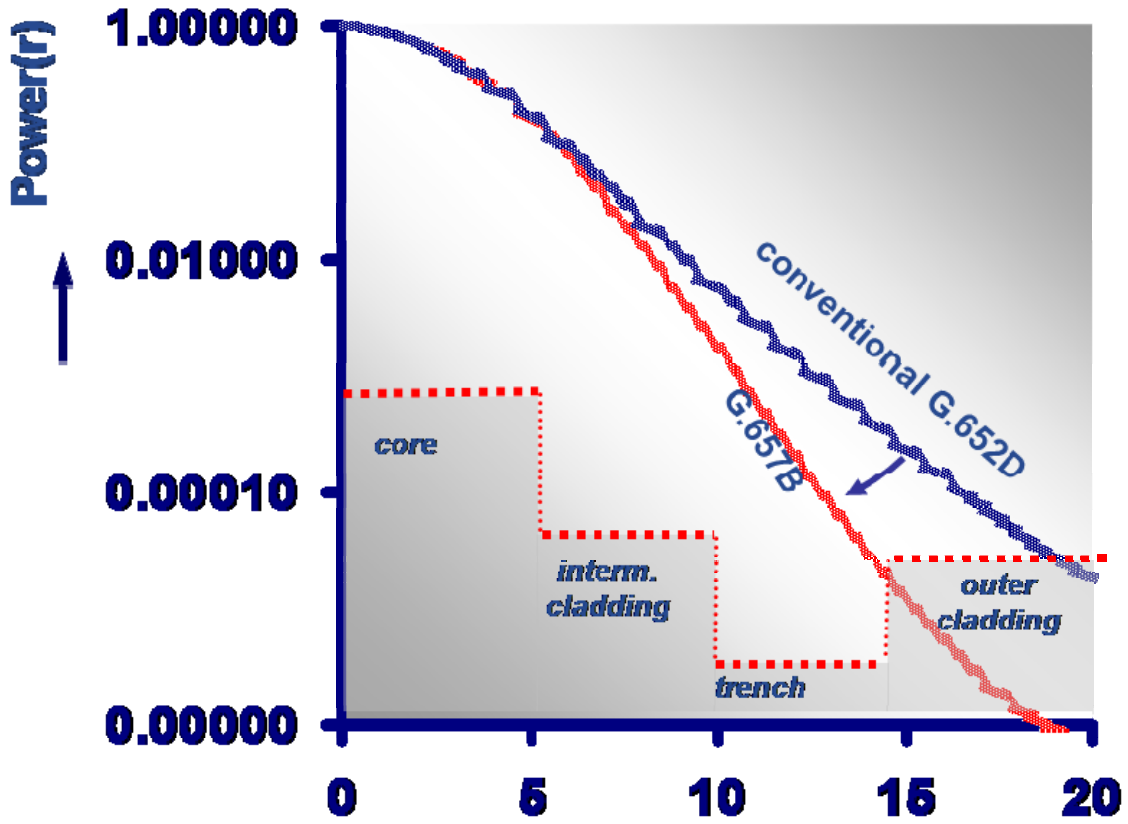
Perfil de salto de índice





Courtesy of Draka

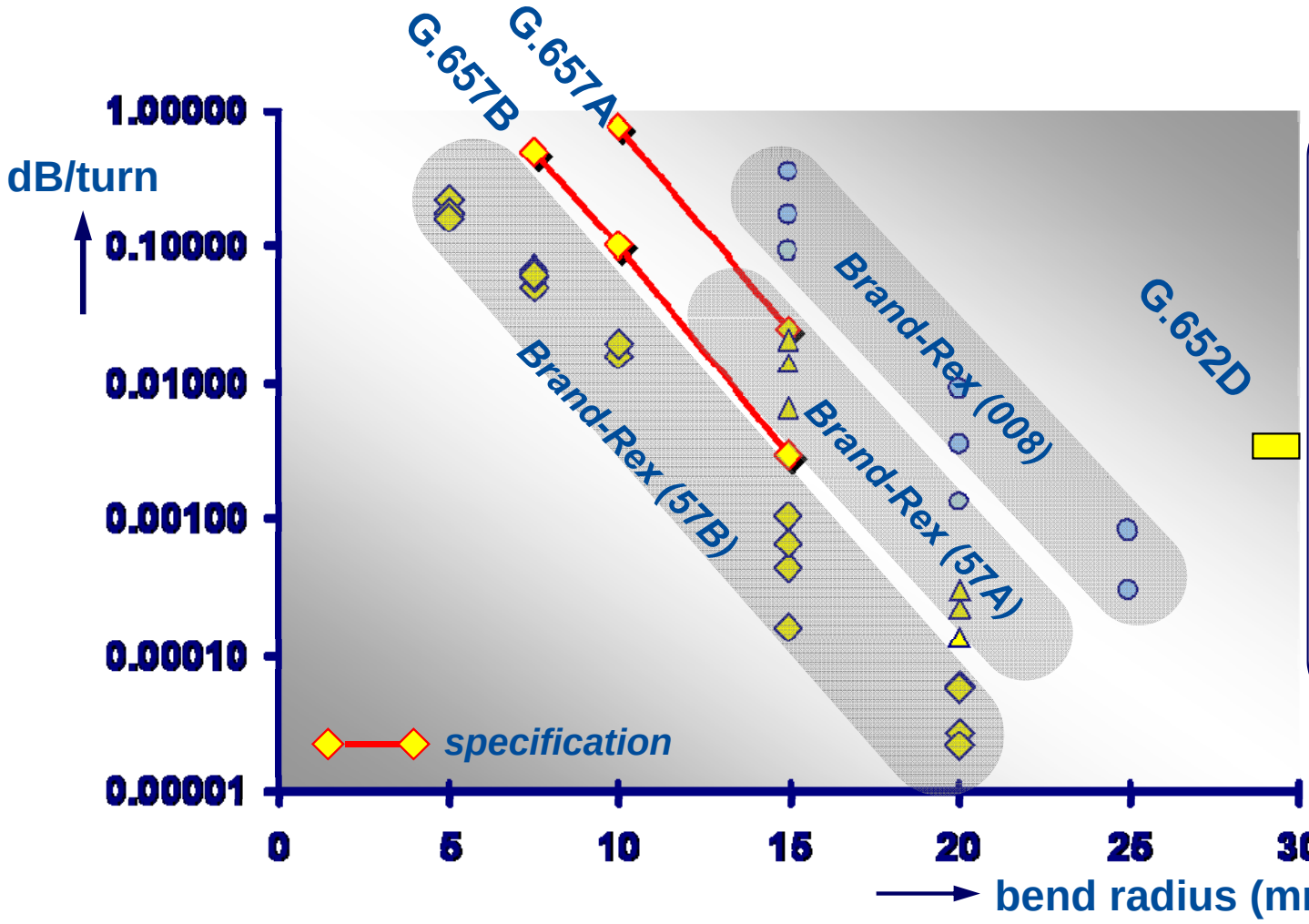
Nueva fibra monomodo G.657B



The trench keeps the light close to the core

Courtesy of Draka

Nueva fibra monomodo G.657B: curvaturas a 1550nm

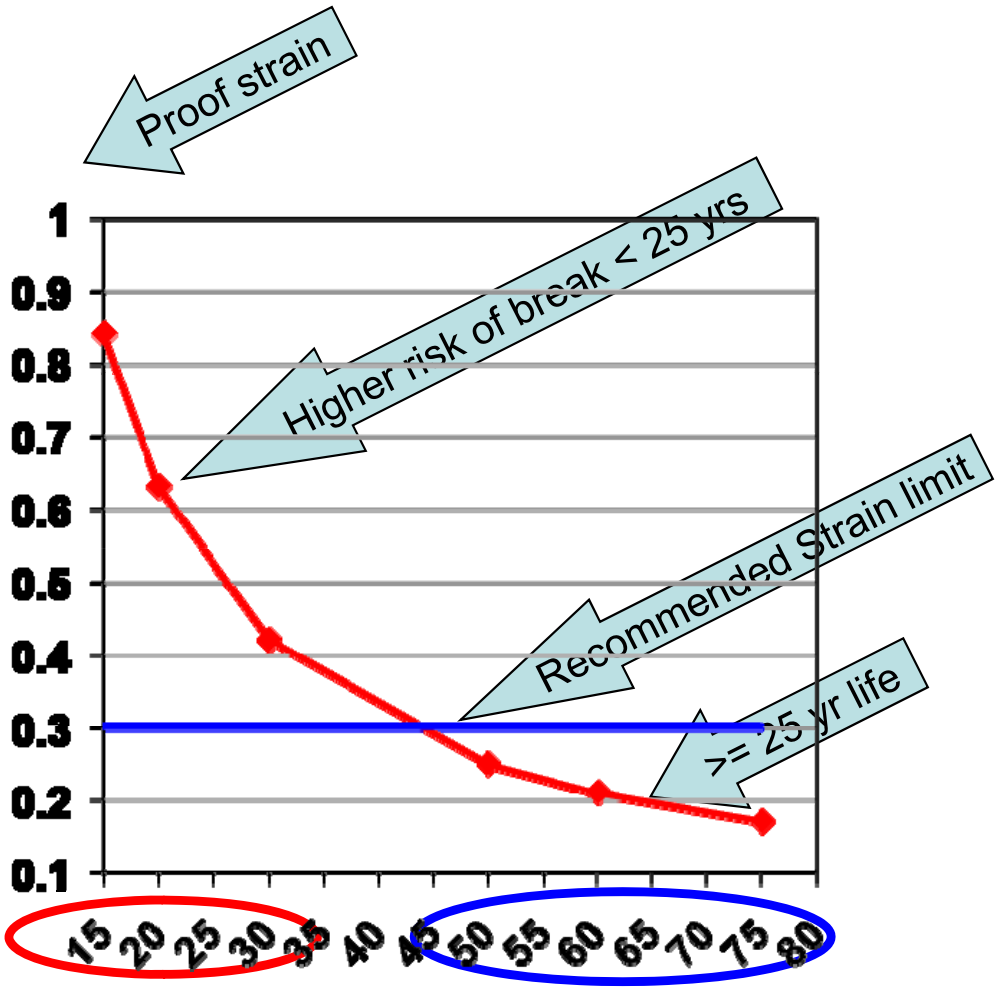


Specification
Trench-assisted
➔ G.657B

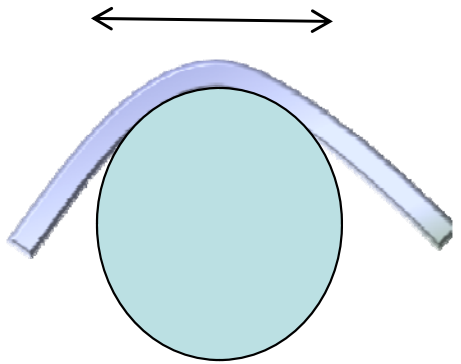
radius	max loss
15	0.003
10	0.1
7.5	0.5
mm	dB/turn

Courtesy of Draka

Tensión superficial en la fibra frente a diámetro de curvatura



Surface in tension



TR 62048 Optical fibres – Reliability – Power law theory

En revisión

Nuevas fibras monomodo G.657A/G.657B

Fibra óptica monomodo insensible a las pérdidas por curvatura

El núcleo de la fibra está diseñado para guiar más estrechamente la luz

G.657A – Beneficios para pigtails y latiguillos en espacios estrechos, y para proteger la red de pérdidas potenciales de señal causados por curvaturas accidentales

G.657B - Beneficios para aplicaciones de larga distancia que utilicen lásers de alta potencia (Raman), minimizando el riesgo de daños a la fibra

RIESGO
La vida útil de la fibra óptica puede comprometerse por curvas cerradas debido a la tensión en la superficie exterior de la fibra

OM4 fibra óptica cableada según ISO/IEC 11801 (borrador)

Table 38 – Multimode optical fibre modal bandwidth

		Minimum modal bandwidth MHz•km		
		Overfilled launch bandwidth		Effective laser launch bandwidth
Wavelength		850 nm	1 300 nm	850 nm
Cabled optical fibre Category	Core diameter µm			
OM1	50 or 62,5	200	500	Not specified
OM2	50 or 62,5	500	500	Not specified
OM3	50	1 500	500	2 000
OM4	50	(1 500 – 3 500) f.f.s	500	4 700

NOTE Minimum effective laser launch bandwidth is assured by either differential mode delay at 850 nm or calculated effective modal bandwidth at 850 nm, as defined in IEC 60793-1-49 and specified in IEC 60793-2-10. Optical fibres that meet only the overfilled launch modal bandwidth may not support some applications specified in Annex F.

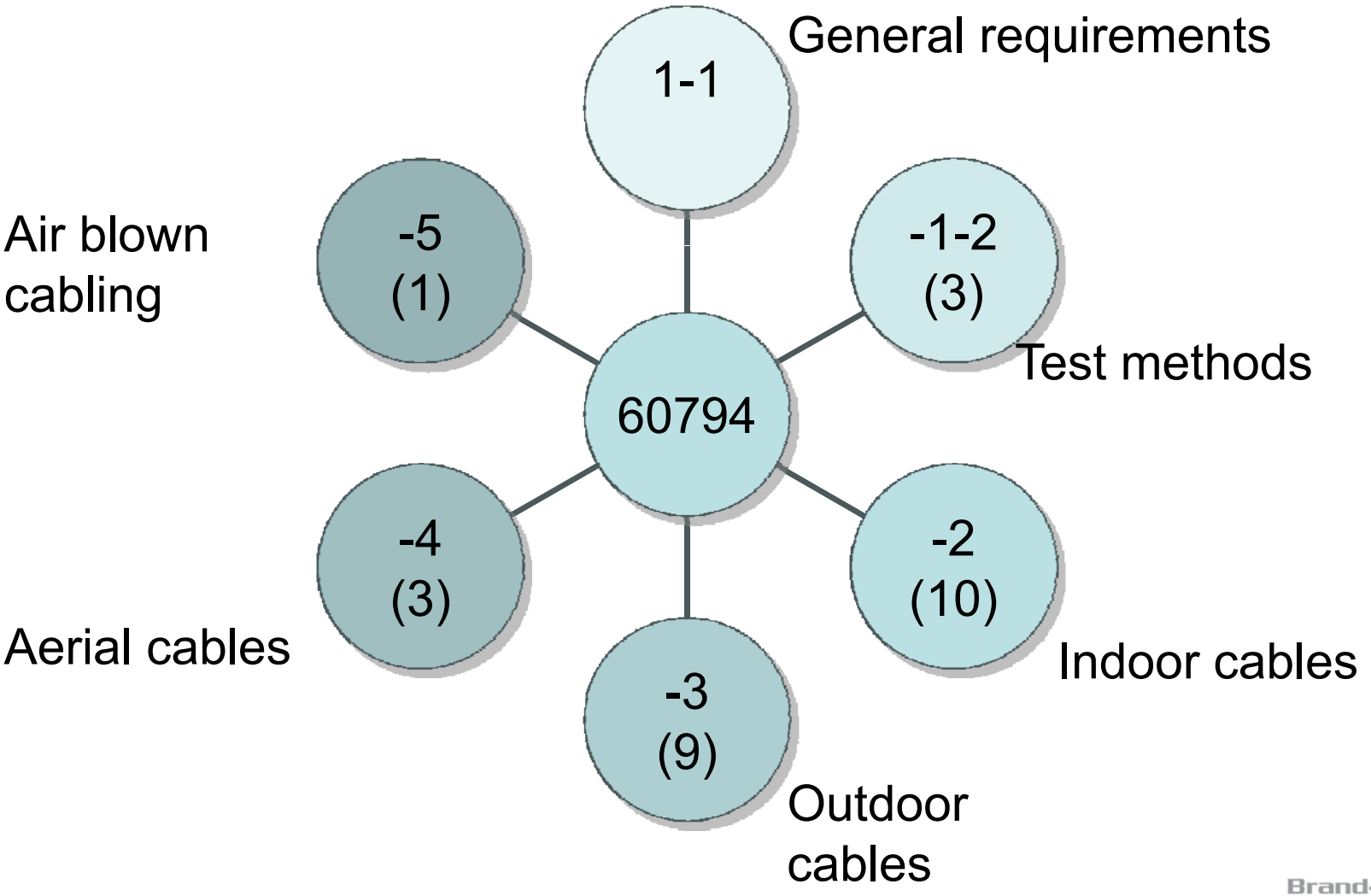
Brand-Rex Z50 (OM4)

Todos nuestros cables que utilizan la fibra Z50 contienen fibra óptica con la mayor especificación de ancho de banda para 50/125, que está siendo estandarizada por ISO/IEC y IEC como OM4

Brand-Rex lleva ofreciendo fibra Z50 (OM4) desde hace 4 años

Admite mayores pérdidas para enlaces de 300m o inferiores
Permite enlaces de 550m si se cumple la atenuación máxima de 10G
Potencial para enlaces extendidos de 40G/ 100G si IEEE lo aprueba

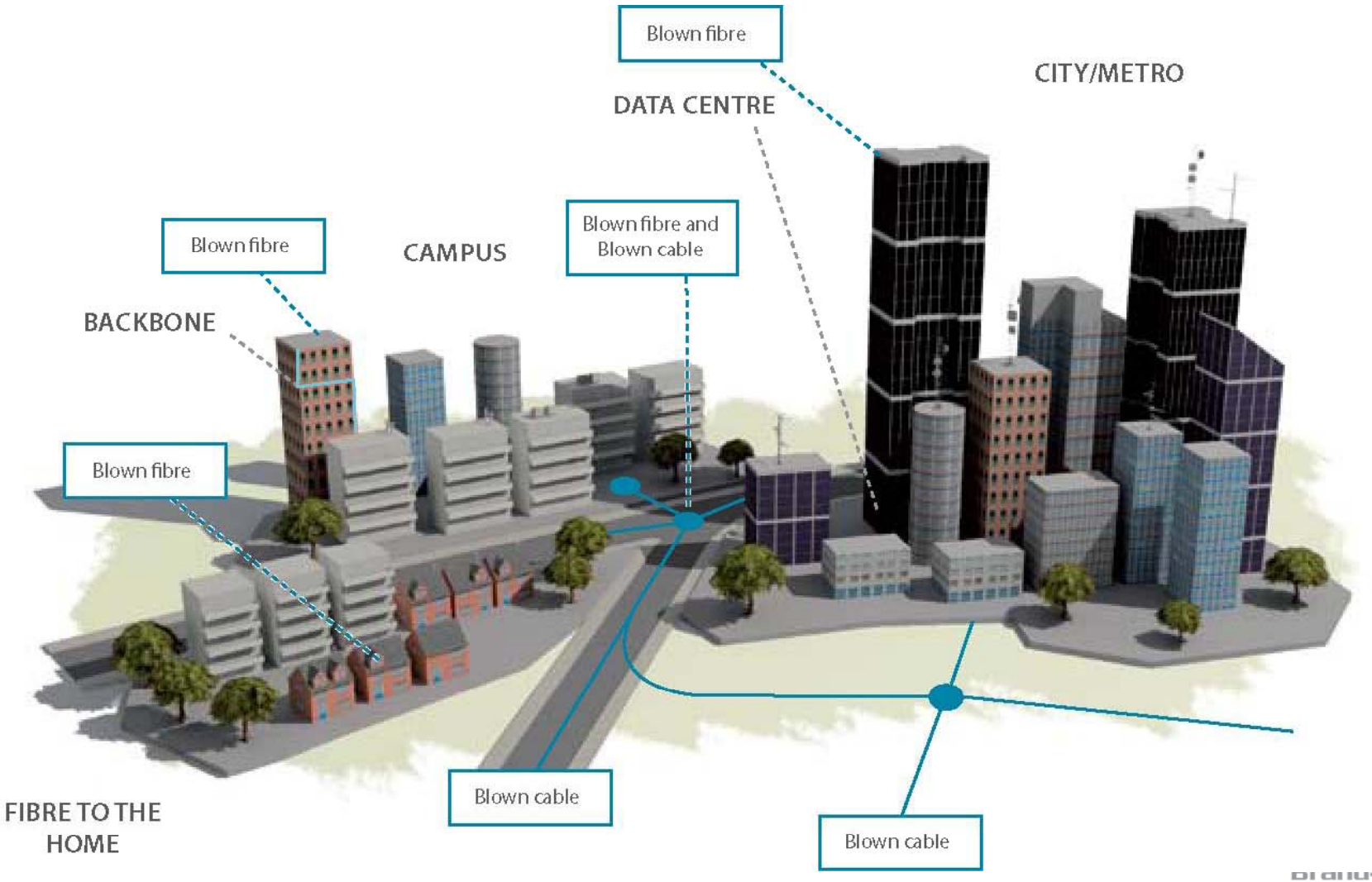
IEC y Cenelec especificaciones parea CABLES de fibra óptica



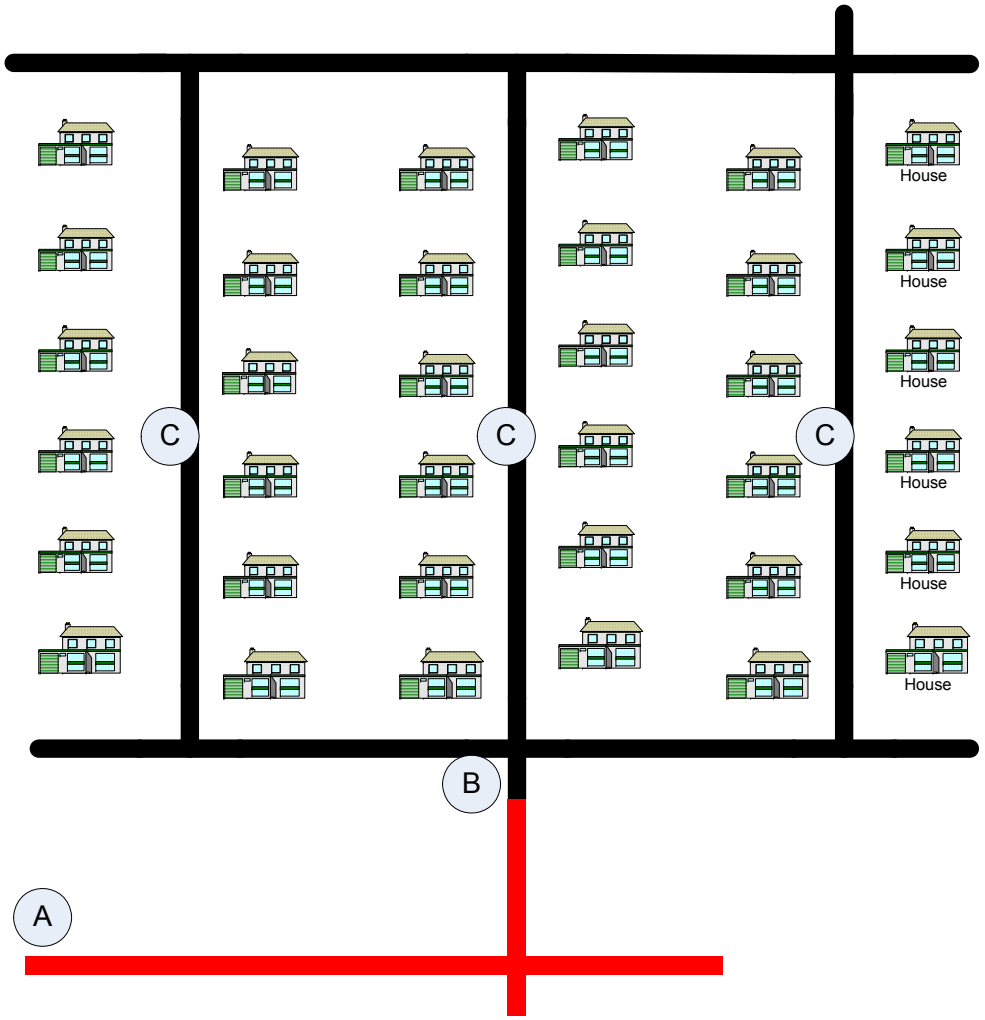
IEC

International Electrotechnical Commission (www.iec.ch)

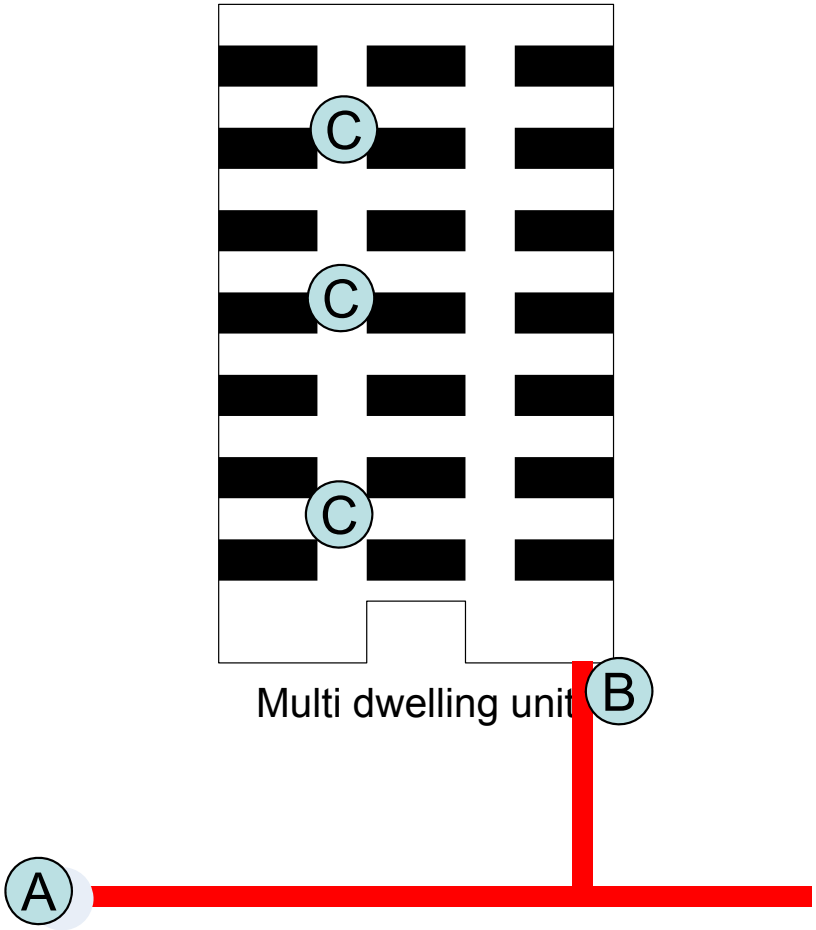
Aplicaciones de Fibra Óptica Soplada



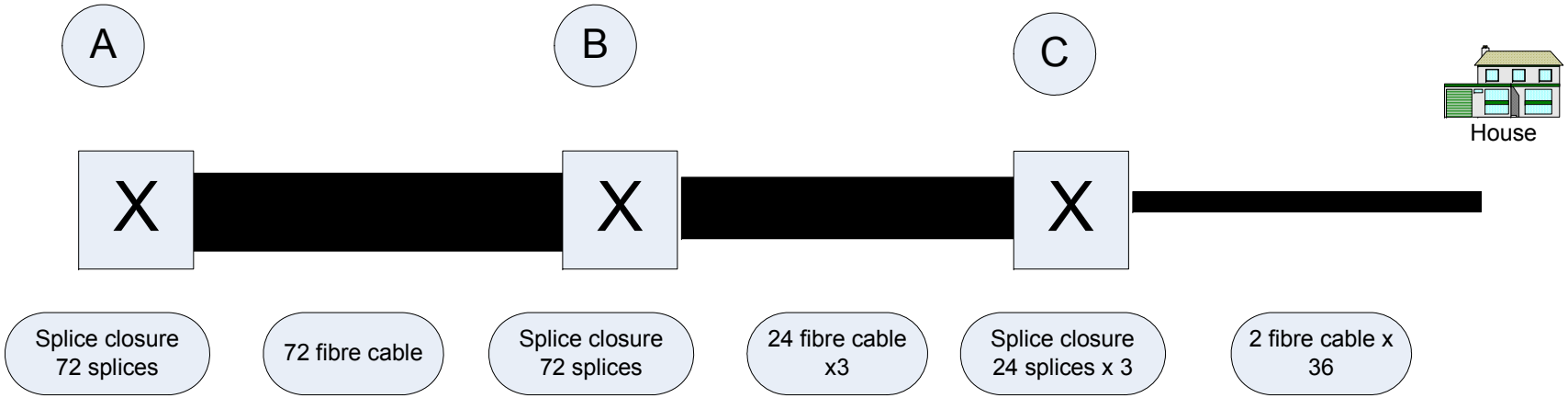
FTTH (fibre to the house)



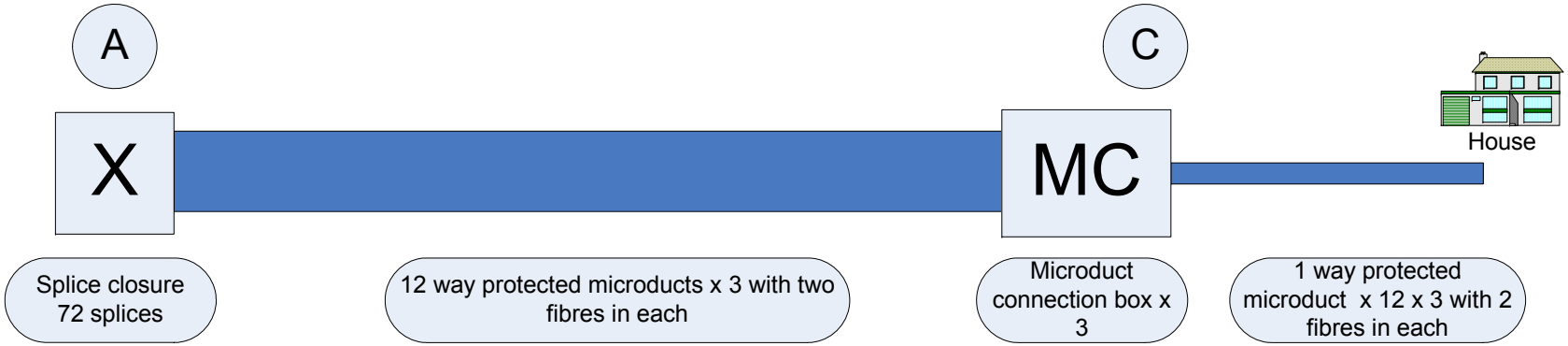
Fibra hasta el puesto



Conectando la fibra desde el nodo hasta el hogar



a) Cables y empames


A
C
House
X
MC
Splice closure 72 splices
12 way protected microducts x 3 with two fibres in each
Microduct connection box x 3
1 way protected microduct x 12 x 3 with 2 fibres in each

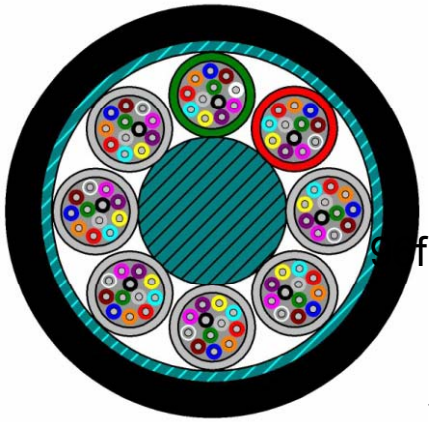
b) Fibra soplada sin empalmes

MicroBlo™

2 a 12f

12 a 72f

HFbbbBMCddWNMz



Un rango extendido de cables MicroBlo™

•MicroCables desde 2 a 96 fibras en 3 tamaños

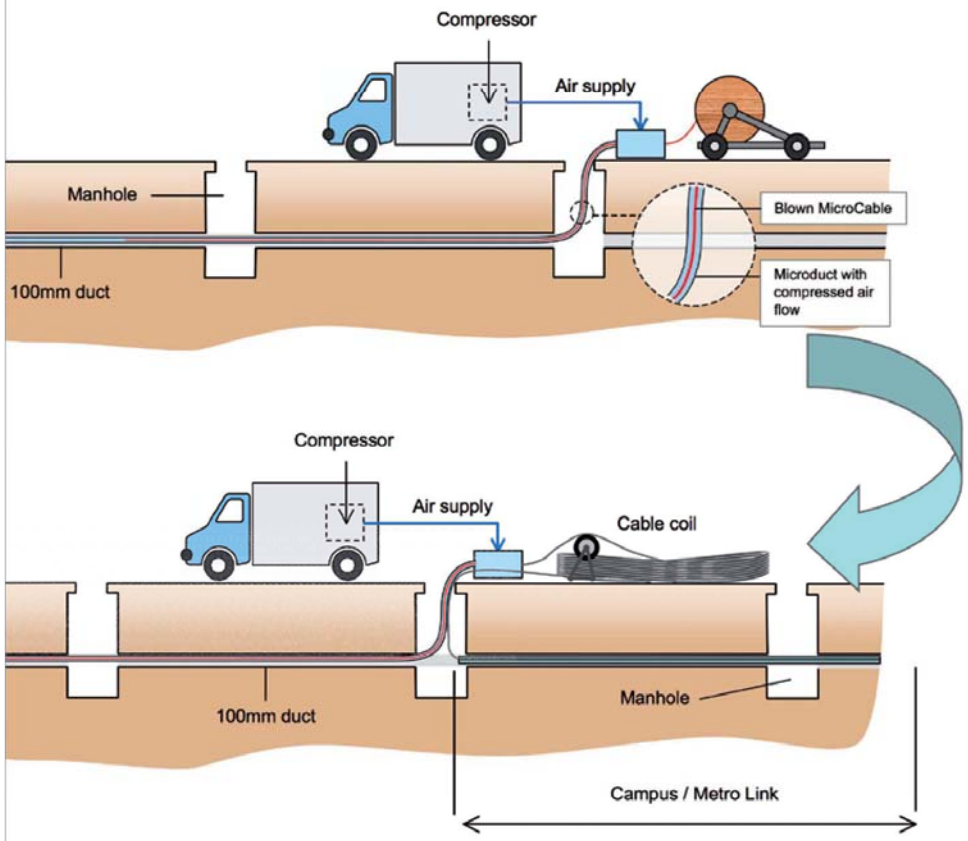
•Permite al diseñador de redes una gran flexibilidad para enlaces urbanos de corta distancia o larga distancia en areas rurales

•Microductos protegidos desde individuales hasta 24 microductos, para entrramiento directo, tendido, o interior

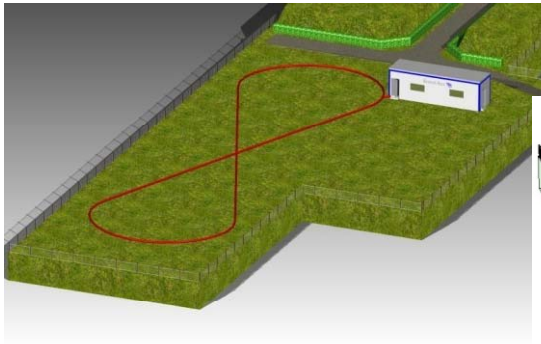
•El cable puede continuar desde rutas de exterior hasta el punto de terminación dentro del edificio

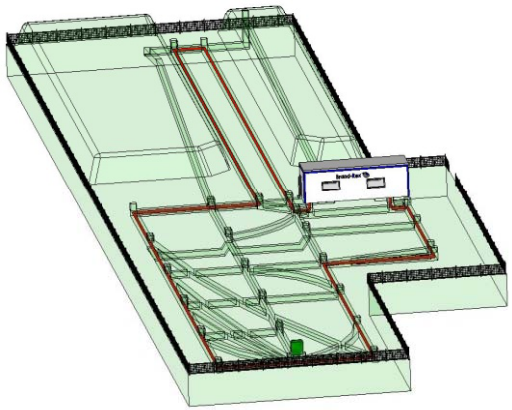
- **Costes diferidos y distribuidos**
- **A prueba de futuro / facilmente ampliable**
- **Flexibilidad**
- **Seguridad**
- **Fácil reparación**

Distancia de instalación optimizada



Pruebas en Brand-Rex





>1km fig 8

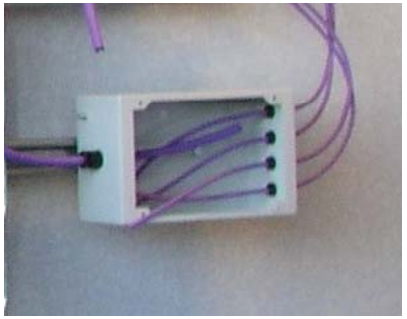
<500m y12 curvas

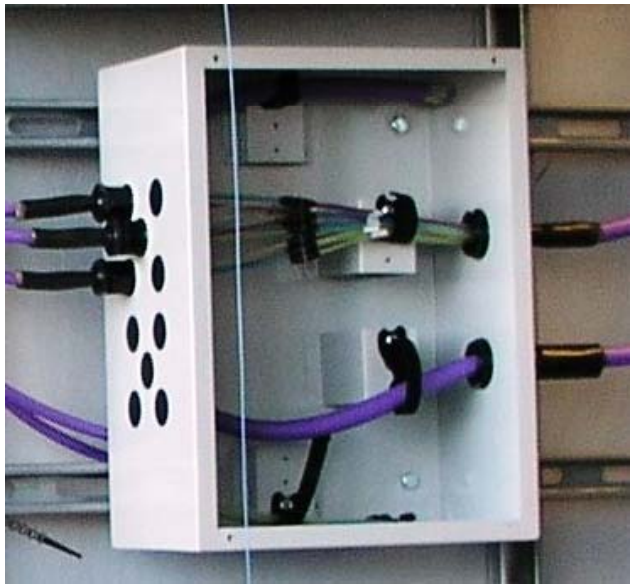
Un microducto recto ofrece la mayor distancia de soplado

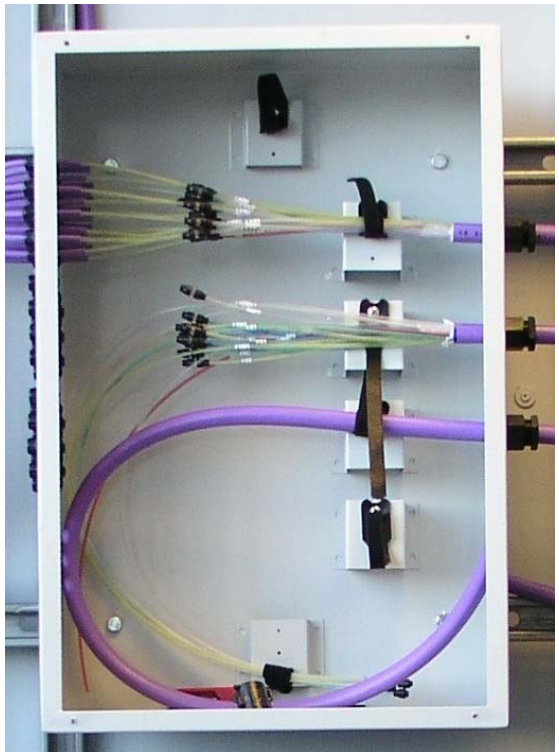
Las curvas reducen la distancia de soplado

Diseñar la red con puntos de acceso permite continuar soplando para alcanzar la máxima distancia

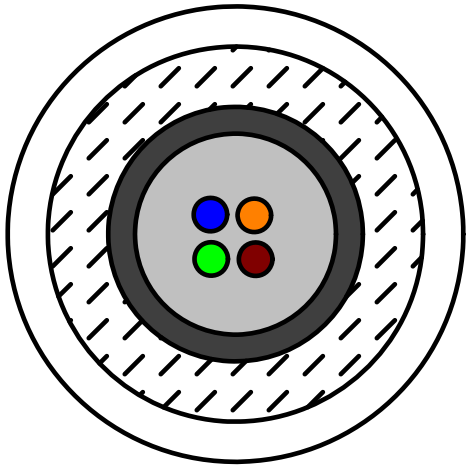
En desarrollo – conectividad robusta de microductos y cajas de terminación de fibra







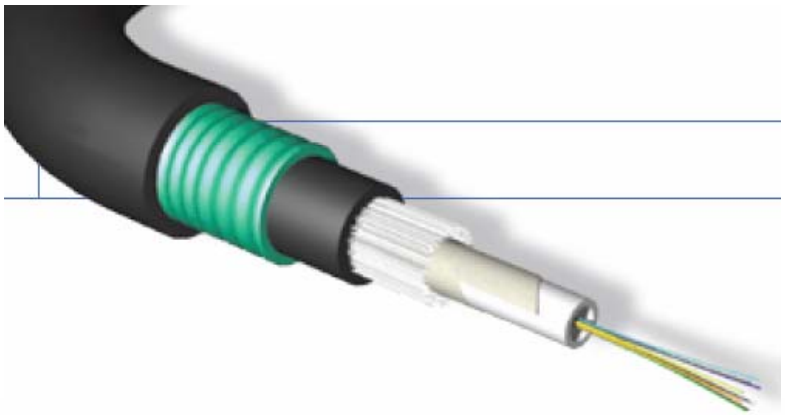
Instalación en Suecia de FTTH



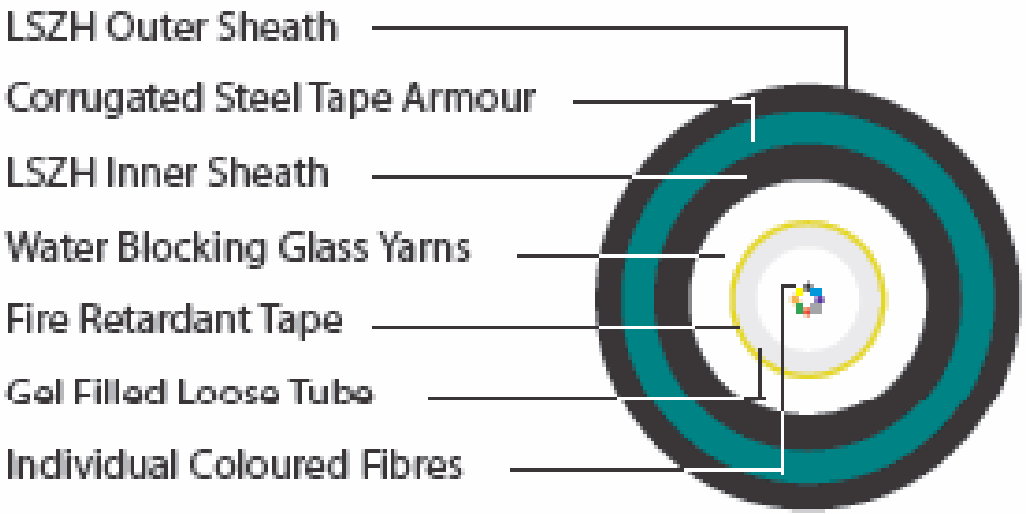
HF008UNI04LU 3.4

Cable miniaturizado de 4 fibras
Características Físicas:
Diámetro Cable : 3.4 mm
Peso: 11.0 kg/km

Cable óptico resistente al fuego



- Los datos son críticos para cualquier organización
- Asegura la transmisión en una situación de incendio
- ¿Deberían todas las redes tener enlaces resistentes al fuego?



HFbbbUNIddLSTALUFS

Brand-Rex

Pruebas en enlaces multimodo

Estándares publicados

ISO/IEC 11801
Generic cabling

ISO/IEC 14763-3
Testing of optical fibre cabling

IEC 61300-3-43

Nuevo método para medir enlaces multimodo

Impacto en:
•instaladores
•Equipos de test
•Formación

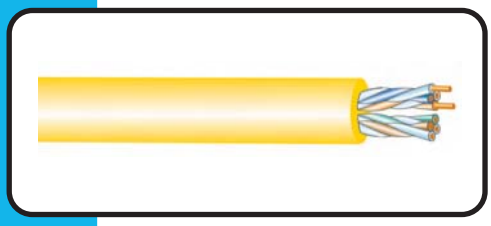
Estándares futuros

ISO/IEC 11801
Generic cabling

ISO/IEC 14763-3 + Amd 1
Testing of optical fibre cabling

IEC 61280-4-1
FDIS approved
Publish Q3 2009

CABLE ULTRACAT CATEGORÍA 5e



DESCRIPCIÓN:
- Conductor de cobre suave de 0.5 mm (24 AWG).
- Aislamiento de polietileno.
- Conductores pareados y cableados.
- Cubierta de PVC

ESPECIFICACIONES:
ANSI/TIA/EIA 568 B2
ISO/IEC 11801
IEC 61156-5
NMX-I-248-NYCE
NMX-I-236/02-NYCE
NOM-001-SEDE
NEC Art. 800

APLICACIONES:
Instalación con un solo piso (CM) o entre pisos (CMR).

Cableado estructurado de máxima velocidad, para las siguientes redes:

10 BASE T	(IEEE 802.3)
100 BASE TX	(FAST ETHERNET)
16/100 Mb/s Token Ring	(IEEE 802.5)
ATM 55/155 Mb/s	
100 Mb/s TP-PMD	(ANSI X3T9.5)
1000 BASE T	(GIGABIT ETHERNET)

VENTAJAS: Para las frecuencias de norma
Como cable, brinda margen adicional de:
- 3 Ω en impedancia de entrada.
- 3 dB en perdida por retorno RL.
- 6 dB en (PSNEXT).

Como enlace, se logra margen adicional de:
- 1 dB en perdida de inserción.
- 10 dB en ACR.

CERTIFICACIÓN:

ETL; 3164364

Impedancia característica de 1 a 250 MHz	Resistencia máxima del conductor a c.d @ 20°C	Capacitancia mutua máxima / (NVP)	Perdida por retorno mínimo (dB)	Retraso diferencial (skew) máximo ns/100 m	Características de Transmisión en 100 m			
					Frecuencia en MHz	Atenuación @ 20°C, dB, máximo	PS NEXT Paradiafonía, potencia total dB mínimo	PS ELEFEXT Telediafonía, potencia total dB mínimo
100 ± 12 Ω	85.3 Ω/km	45.9 pF/m (68 %)	28 + 5 log (f) 10 > f > 1 28 20 > f > 10 28 - 7 • log (f/20) 100 > f ≥ 20 (f en MHz)	45 1 a 100 MHz	1	2.0	70	68
					4	4.0	59	58
					8	5.8	54	53
					10	6.5	53	51
					16	8.3	50	47
					31.25	11.7	46	41
					62.5	17.0	41	35
					100	22.0	38	31
					200*	32.5*	34*	25*
					250*	36.8*	32*	23*
					350*	44.8*	30*	20*

* Valores típicos, no hay de norma para estas frecuencias

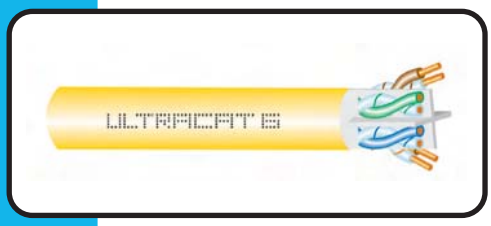
Código de producto	Número de pares	Color de cubierta	Categoria de flama	Diámetro sobre aislamiento mm	Espesor de cubierta mm	Dlámetro externo mm	Peso neto del cable kg/km	Longitud nominal de empaque m
66445872	4	Amarillo	CM	0.96	0.51	5.1	30	305
66445812		Azul						
66445832		Gris						
66445972		Amarillo	CMR					
66445912		Azul						
66445932		Gris						

Nota: Valores nominales, sujetos a tolerancia de manufactura

GARANTIA DE POR VIDA GARANTIA

- Los valores mostrados son nominales sujetos a tolerancias de manufactura

CABLE ULTRACAT CATEGORÍA 6



DESCRIPCIÓN:
- Conductor de cobre suave de 0.57 mm
- Aislamiento de polietileno.
- Conductores pareados y cableados.
- Separador de polietileno para alto desempeño contra diafonía.
- Cubierta de PVC

ESPECIFICACIONES:
ANSI/TIA/EIA 568- B2.1
ISO/IEC 11801
NMX-I-248-NYCE
NMX-I-236/02-NYCE
IEC 61156-5
NOM-001-SEDE
NEC Art. 800

APLICACIONES:
Instalación de un solo piso (CM) o entre pisos (CMR).

Cableado estructurado de máxima velocidad, para las siguientes redes:

10 BASE T	(IEEE 802.3)
100 BASE TX	(FAST ETHERNET)
16/100 Mb/s Token Ring	(IEEE 802.5)
ATM 55/155/1200 Mb/s	
100 Mb/s TP-PMD	(ANSI X3T9.5)
1000 BASE T	(GIGABIT ETHERNET)

VENTAJAS: Para las frecuencias de norma
Como cable, brinda margen adicional de:
- 3 Ω en impedancia de entrada.
- 3 dB en perdida por retorno RL.
- 6 dB en (PSNEXT).

Como enlace, se logra margen adicional de:
- 1 dB en perdida de inserción.
- 10 dB en ACR.

CERTIFICACIÓN:
ETL; 3164364

Impedancia característica de 1 a 250 MHz	Resistencia máxima del conductor a c.d @ 20°C	Capacitancia mutua máxima / (NVP)	Perdida por retorno mínimo (dB)	Retraso diferencial (skew) máximo ns/100 m	Características de Transmisión en 100 m			
					Frecuencia en MHz	Atenuación @ 20°C, dB, máximo	PS NEXT Paradiafonía, potencia total dB mínimo	PS ELEFEXT Telediafonía potencia total dB mínimo
100 ± 12 Ω	70 Ω/km	45.9 pF/m (66 %)	28 + 5 log (*f*) 10 > *f* > 1 28 20 > *f* > 10 28 - 7 • log (*f*/20) 250 > *f* > 20 (*f* en MHz)	45 1 a 250 MHz	1	1.8	78	76
					4	3.6	69	64
					8	5.3	65	58
					10	5.9	63	56
					16	7.5	60	52
					31.25	10.5	56	46
					62.5	15.2	51	40
					100	19.6	48	36
					200	28.5	44	30
					250	32.2	42	24
					350*	39.5*	34	16
					400*	43.0*	33	14
					500*	49.0*	32	13
					600*	54.5*	30	10

* Valores típicos, no hay de norma para estas frecuencias

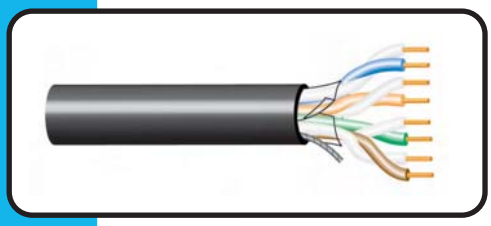
Código de producto	Número de pares	Color de cubierta	Categoría de flama	Diámetro sobre aislamiento mm	Espesor de cubierta mm	Diámetro externo mm	Peso neto del cable kg/km	Longitud nominal de empaque m
66446875	4	Amarillo	CM	0.96	0.65	6.7	42	305
66446815		azul						
66446835		Gris						
66446975		Amarillo	CMR					
66446935		Gris						
66446915		Azul						

Nota: Valores nominales, sujetos a tolerancia de manufactura

GARANTIA DE POR VIDA GARANTIA

CONDUMEX CABLES

CABLE SIN BLINDAR (UTP) CATEGORÍA 5e CMX USO INTERIOR-EXTERIOR



DESCRIPCIÓN:
- Conductor de cobre sólido de 0,5 mm (24 AWG).
- Aislamiento de polietileno.
- Conductores pareados y cableados.
- Cinta Poliéster.
- Cubierta exterior de PVC negro (antillama y resistente a intemperie).

ESPECIFICACIONES:
ANSI/TIA/EIA 568 B2
ISO/IEC 11801
NMX-I-236/02
NOM-001-SEDE
NEC (NFPA)

APLICACIONES:
Instalación en trayectorias en condiciones de intemperie; radiación solar, lluvia, inmersión en agua por periodos cortos.

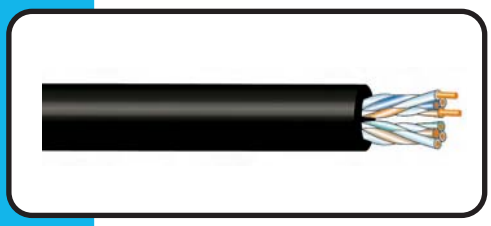
10 BASE T	(IEEE 802.3)
4/16 Mb/s Token Ring	(IEEE 802.5)
100 Mb/s TP-PMD	(ANSI X3T9.5)
55/155Mb/s ATM	
1000BASE-T	(IEEE802.3 ab)

Resistencia a c.d. por conductor máxima a @ 20°C	Impedancia característica Zo de 1 a 100 MHz	Capacitancia mutua nominal pF/m	Retorno estructural mínimo (f en MHz) dB	Retraso diferencial máximo (skew) ns	Características de Transmisión en 100 m			
					Frecuencia MHz	Atenuación máxima dB	Paradiafonía mínima en potencia total (PSNEXT) dB	Telediafonía mínima en potencia total (PSELFEXT) dB
85.3 Ω/km	100Ω±15	45.9	25 (20≥f) 25-7Log(f/20) (100≥f≥20)	45	4	4.1	53	49
					10	6.5	47	41
					16	8.2	44	37
					31	11.7	40	31
					100	22.0	32	21
					200*	32.0*	28*	18*
					250*	35.0*	26*	16*

*Valores típicos, no hay normalizados a esta frecuencia

Código	Número de pares	Espesor de cubierta mm	Diámetro externo nominal mm	Categoría de flama	Peso neto aproximado kg/km	Longitud de empaque m
664457	4	0.55	7.0	CMX	55	305

CABLE SIN BLINDAR (UTP) CATEGORÍA 5e USO EXTERIOR



DESCRIPCIÓN:
- Conductor de cobre suave de 0.5 mm (24 AGW).
- Aislamiento de polietileno.
- Conductores pareados y cableados.
- Compuesto de relleno.
- Cubierta de polietileno color negro, resistente a la intemperie.

ESPECIFICACIONES:
ANSI/TIA/EIA 568 B-2
ISO/IEC 11801
NMX-I-236/02

APLICACIONES:
Enlaces en exterior para terminales de cableado estructurado y otros equipos de alta velocidad. De acuerdo al código nacional de instalaciones NOM-001-SEDE, estos cables solo se pueden instalar en interiores si van protegidos dentro de un tubo conduit metálico.

10 BASE T	(IEEE 802.3)
4/16 Mb/s Token Ring	(IEEE 802.5)
100 Mb/s TP-PMD	(ANSI X3T9.5)
55/155 Mb/s ATM	
1000 BASE-T	(IEEE 802.3 ab)

Resistencia a c.d. por conductor máxima a @ 20°C	Impedancia característica Zo de 1 a 100 MHz	Capacitancia mutua nominal pF/m	Retorno estructural mínimo (f en MHz) dB	Retraso diferencial máximo (skew) ns	Características de Transmisión en 100 m			
					Frecuencia MHz	Atenuación máxima dB	Paradiafonía mínima en potencia total (PSNEXT) dB	Telediafonía mínima en potencia total (PSELFEXT) dB
85.3 Ω/km	100Ω±15	45.9	25 (20≥f) 25-7Log(f/20) (100≥f≥20)	45	4	4.1	53	49
					10	6.5	47	41
					16	8.2	44	37
					31	11.7	40	31
					100	22.0	32	21
					200*	32.0*	28*	18*
					250*	35.0*	26*	16*

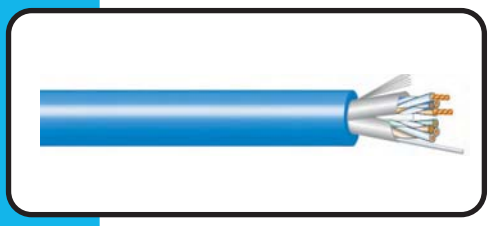
*Valores típicos, no hay normalizados a esta frecuencia

Código de producto	Pares	Diámetro nominal sobre aislamiento mm	Diámetro externo nominal mm	Peso neto aproximado kg / km	Longitud nominal de empaque m
664464	4	0.90	6.0	35	305

Notas: Dimensiones nominales, sujetas a tolerancia de manufactura

RoHS
CONDUMEX ECOLOGICO

CABLE BLINDADO (FTP) CATEGORÍA 5e CM



DESCRIPCIÓN:
- Conductor de cobre sólido de 0.5 mm (24 AWG).
- Aislamiento de polietileno.
- Conductores pareados y cableados.
- Hidro dren.
- Cinta plástica aluminizada.
- Cubierta exterior de PVC antillama.

ESPECIFICACIONES:
ANSI/TIA/EIA 568 B2
ISO/IEC 11801
NMX-I-236/02
NOM-001-SEDE
NEC artículo 800

APLICACIÓN:
Cableado estructurado blindado con las siguientes redes:

10 BASE T	(IEEE 802.3)
100 BASE-VG	(100BASE-NE)
4/16 Mb/s Token Ring	(IEEE 802.5)
55/155 Mb/s ATM	
100 Mb/s TP-PMD	(ANSI X3T9.5)
1000 BASE-T	(IEEE 802.3 ab)

CERTIFICACIÓN:
ETL; 3164364

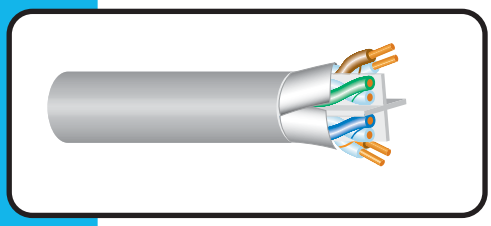
Resistencia a c.d. por conductor máxima a @ 20°C	Impedancia característica Zo de 1 a 100 MHz	Capacitancia mutua nominal pF/m	Retorno estructural mínimo (f en MHz) dB	Retraso diferencial máximo (skew) ns	Características de Transmisión en 100 m			
					Frecuencia MHz	Atenuación máxima dB	Paradiafonía mínima en potencia total (PSNEXT) dB	Telediafonía mínima en potencia total (PSELFEXT) dB
85.3 Ω/km	100Ω±15	45.9	25 (20≥f) 25-7Log(f/20) (100≥f≥20)	45	4	4.1	53	49
					10	6.5	47	41
					16	8.2	44	37
					31	11.7	40	31
					100	22.0	32	21
					200*	32.0*	28*	18*
					250*	35.0*	26*	16*

*Valores típicos, no hay normalizados a esta frecuencia

Código	Número de pares	Diámetro externo mm	Peso neto kg/km	Espesor de cubierta mm	Color de cubierta	Longitud de empaque m
66444515	4	6.5	38	0.5	Azul	305

- Los valores mostrados son nominales sujetos a tolerancias de manufactura

CABLE BLINDADO (FTP) CATEGORÍA 6 CM



DESCRIPCIÓN:
- Conductor de cobre sólido de 0.57 mm.
- Aislamiento de polietileno.
- Conductores pareados y cableados.
- Separador de polietileno para asegurar alto desempeño en diafonía.
- Cinta plástica aluminizada e hilo dren.
- Cubierta de PVC.

ESPECIFICACIONES:
ANSI/EIA/TIA 568-B2.1
ISO/IEC 11801
NMX-I-248, NEC (NFPA)
NMX-I-236/02-NYCE
IEC 61156-5
NOM-001-SEDE

APLICACIONES:
Instalación en un solo piso, redes blindadas para sistemas.

10 BASE T	(IEEE 802.3)
16 TOKEN RING	(IEEE 802.5)
100 BASE BG	
100 Mb/s TP-PMD	(ANSI X3T9.5)
1.2 Gb/s ATM	
1000 BASE T	(IEEE802.3 ab)

CERTIFICACIÓN:
A12354 para el sistema de calidad bajo ISO 9000

CERTIFICACIÓN:
ETL; 3164364

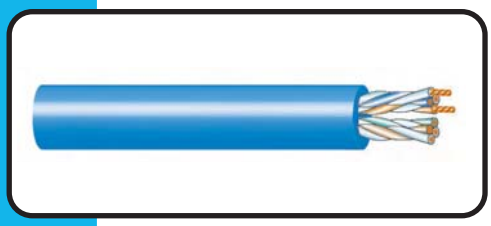
Resistencia a c.d. por conductor máxima a @ 20°C	Impedancia de entrada Ω	Capacitancia mutua nominal pF/m	Retorno estructural mínimo (f en MHz) dB	Retraso diferencial máximo (skew) ns	Características de Transmisión en 100 m			
					Frecuencia MHz	Atenuación máxima dB	Paradiafonía mínima en potencia total (PSNEXT) dB	Telediafonía mínima en potencia total (PSELFEXT) dB
70 Ω/km	100±15 (1-100 MHz) 100±22 (100-200 MHz) 100±32 (200-250 MHz)	45.9	20+5 Log_{10} (f) (1-10 MHz) 25 (10-20MHz) 25-7 Log_{10} (f) (20-250 MHz)	45	10	6.0	57.3	44.8
					16	7.7	54.2	40.7
					31	10.7	50.0	34.9
					100	19.8	42.3	24.8
					200	29.0	37.8	18.8
					250	32.8	36.3	16.8
					350*	40.5*	34.0*	14.5*
					400*	43.1*	32.0*	12.0*

*Valores típicos, no hay normalizados a esta frecuencia

Código	Categoría de flama	Número de pares	Diámetro externo mm	Peso neto kg/km	Espesor de cubierta mm	Longitud de empaque m
66496615	CM	4	7.6	51	0.52	305

- Los valores mostrados son nominales sujetos a tolerancias de manufactura

CORDÓN FLEXIBLE SIN BLINDAR (UTP) CATEGORÍA 5 CM



DESCRIPCION:
- Conductor multifilar de cobre.
- Aislamiento de polietileno.
- Conductores pareados y cableados.
- Cubierta exterior de PVC.

ESPECIFICACIONES:
ANSI/TIA/EIA 568-A5
ISO/IEC 11801
NMX-I-248-NYCE
NMX-I-236/03-NYCE
NOM-001-SEDE
NEC artículo 800

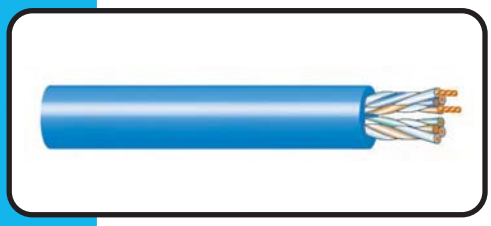
APLICACIONES:
Conexión de salida al equipo en área de trabajo o en distribuidores, para las siguientes redes:
10 Mbps (BASE T) (IEEE 802.3)
4/16 Mbps Token Ring (IEEE 802.5)
100 Mbps TP-PMD
ATM-55/155 Mbps

CERTIFICACIÓN:
ETL; 3164364

Calibre AWG (mm)	Resistencia óhmica nominal Ω/km	Impedancia característica Ω de 1 a 100 MHz	Capacitancia mutua nominal pF/m	Características de Transmisión en 100 m		
				Frecuencia MHz	Atenuación máxima dB	Atenuación de paradiafonía mínima dB
24 (7 x 32)	79	100±15	45.9	4	4.9	53
				10	7.8	47
				16	9.9	44
				31.25	14.1	39
				100	26.4	32

Número de producto	Número de pares	Peso Kg/Km	Espesor de cubierta mm	Diámetro exterior mm	Longitud de empaque reelex m
654460	4	34.8	0.52	4.7	305

CORDÓN FLEXIBLE SIN BLINDAR (UTP) CATEGORÍA 5e CM



DESCRIPCIÓN:
- Conductor multifilar de cobre estañado.
- Aislamiento de polietileno.
- Conductores pareados y cableados.
- Cubierta exterior de PVC antillama.

ESPECIFICACIONES:
Excede:
ANSI/TIA/EIA 568 A
ISO/IEC 11801
NMX-I-248
NMX-I-236/03-NYCE
NOM-001-SEDE
NEC art. 800

APLICACIONES:
Conexión de salida al equipo en área de trabajo o en distribuidores para Gigabit Ethernet entre otras redes:
10 BASE T (IEEE 802.3)
100 BASE-VG (100BASE-NE)
4/16 Mb/s Token Ring (IEEE 802.5)
55/155 Mb/s ATM
100 Mb/s TP-PMD (ANSI X379.5)
1000 BASE-T (IEEE 802.3 ab)

CERTIFICACIÓN:
ETL; 3164364

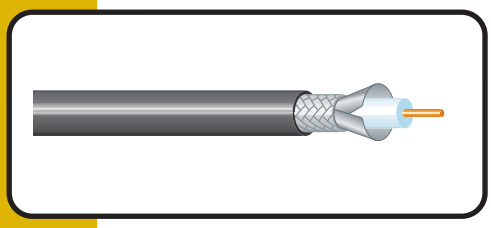
Resistencia a c.d. por conductor máxima a @ 20°C	Impedancia característica de 1 a 100 MHz	Capacitancia mutua nominal pF/m	Retorno estructural mínimo (f en MHz) dB	Retraso diferencial máximo (skew) ns	Características de Transmisión en 100 m		
					Frecuencia MHz	Atenuación máxima dB	Paradiafonía mínima en potencia total (PSNEXT) dB
85.3 Ω/km	100Ω±15	45.9	25 (20≥f≥) 25-7Log(f/20) (100≥f≥20)	45	4	4.9	56
					10	7.8	50
					16	9.9	47
					31	14.1	43
					100	26.4	36
					200	34.8*	31*
					250	40.3*	29*
					350	49.5*	27*

*Valores típicos, no hay normalizados a esta frecuencia

Código	Número de pares	Diámetro externo mm	Peso neto kg/km	Espesor de cubierta mm	Longitud de empaque m
664556	4	6.5	38	0.5	305

- Los valores mostrados son nominales sujetos a tolerancias de manufactura

CATV 6/60



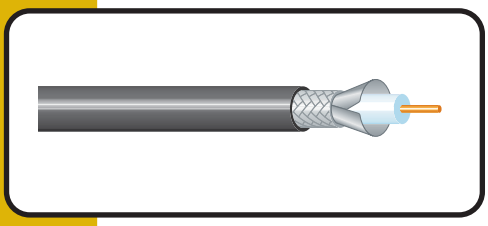
DESCRIPCIÓN:
- Conductor de cobre o acero recubierto de cobre.
- Aislamiento de polietileno celular.
- Cinta de poliéster aluminizado.
- Malla de aluminio.
- Cubierta de PVC.

APLICACIÓN:
TV por satélite (DTH), por cable, o por microonda (MVS), TV abierta UHF, VHF (2 al 13), conexión de TV a equipo de video en cinta (VHS) o disco (DVD).

ESPECIFICACIONES:
ANSI/SCTE 74 (IPS-SP-001)

Código	Longitud de empaque m	Peso kg/km	Conductor central Resistencia a c.d. nominal	Diámetro aislamiento mm	Diámetro exterior mm	Cubrimiento de la malla %	Impedancia Ω	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100m
										5	2.7
										55	5.3
800071	500	47	1.02 mm (18 AWG)	4.50 (0.177")	6.7 (0.264")	60	75±3	82	52	211	10.0
803071	300		102 Ω/ km							300	11.7
										450	14.5
809218	150 (caja)									550	16.1
										750	18.6
										1,000	21.5

CATV 59/22

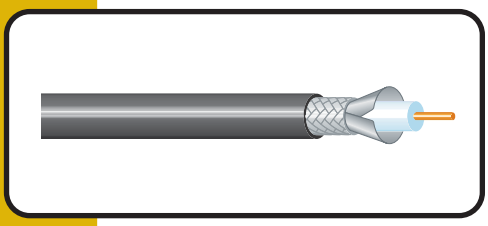


DESCRIPCIÓN:
- Conductor de cobre o acero recubierto de cobre.
- Aislamiento de polietileno celular.
- Cinta de poliéster aluminizado.
- Malla de aluminio.
- Cubierta de PVC color negro.

APLICACIÓN:
TV abierta UHF, VHF (2 al 13), conexión de TV a equipo de video en cinta (VHS) o disco (DVD).

Código	Longitud de empaque m	Peso kg/km	Conductor central Resistencia a c.d. nominal	Diámetro aislamiento mm	Diámetro exterior mm	Cubrimiento de la malla %	Impedancia Ω	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100m
										5	2.8
800080	500	34	0.64 mm (22 AWG)	3.65 (0.144")	6.15 (0.242")	40	85±3	81	48	55	6.7
										211	12.5
800084	100 (rollo)		270 Ω/ km							270	13.9
										300	14.6
										450	17.7

CATV 59/40

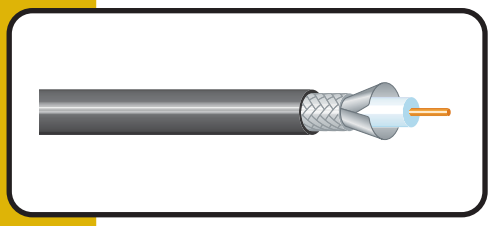


DESCRIPCIÓN:
- Conductor de cobre o acero recubierto de cobre.
- Aislamiento de polietileno celular.
- Cinta de poliéster aluminizado.
- Malla de aluminio.
- Cubierta de PVC color negro.

APLICACIÓN:
TV por microondas (MVS), TV abierta UHF, VHF (2 al 13), en zonas con bajo nivel de interferencia, conexión de TV a equipo de video en cinta (VHS) o disco (DVD).

Código	Longitud de empaque m	Peso kg/km	Conductor central Resistencia a c.d. nominal	Diámetro aislamiento mm	Diámetro exterior mm	Cubrimiento de la malla %	Impedancia Ω	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100m
										5	2.8
800070	500	35	0.81 mm (20 AWG)	3.71 (0.146")	6.05 (0.238")	40	75±3	81	53	55	6.7
										211	12.5
800074	100 (rollo)		161.4 Ω/ km							300	14.6
										450	17.7
800111	500 (marfil)									550	19.5

CATV 59/60



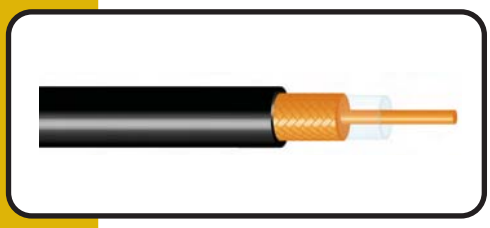
DESCRIPCIÓN:
- Conductor de cobre o acero recubierto de cobre.
- Aislamiento de polietileno celular.
- Cinta de poliéster aluminizado.
- Malla de aluminio.
- Cubierta de PVC color negro.

APLICACIÓN:
TV por microonda (MVS), TV abierta UHF, VHF (2 al 13), en zonas urbanas estándar, conexión de TV a equipo de video en cinta (VHS) o disco (DVD).

ESPECIFICACIONES:
ANSI/SCTE 74 (IPS-SP-001)

Código	Longitud de empaque m	Peso kg/km	Conductor central Resistencia a c.d. nominal	Diámetro aislamiento mm	Diámetro exterior mm	Cubrimiento de la malla %	Impedancia Ω	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100m
800057	500	36	0.81 mm (20 AWG) 161.4 Ω/ km	3.66 (0.144")	6.15 (0.242")	60	75±3	81	53	5	2.8
										55	6.7
										211	12.5
										300	14.6
										450	17.7
										550	19.5

RG 59 B/U



DESCRIPCIÓN:
- Conductor central, alambre de cobre.
- Aislamiento de polietileno sólido.
- Malla de cobre.
- Cubierta de PVC color negro.

APLICACIÓN:
Sistemas de seguridad, vigilancia, antenas de TV abierta VHF (2 al 13), TV en circuito cerrado.

ESPECIFICACIONES DE REFERENCIA:
MIL-C-17

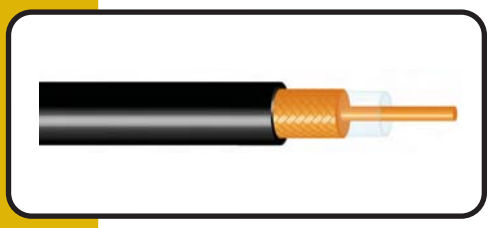
CARACTERÍSTICAS MECÁNICAS

Código	Peso neto kg/km	Diámetro del conductor central	Diámetro de aislamiento mm	Diámetro externo mm	Cobertura de la malla %	Longitud de empaque m
804281	56.5	0.574 mm (23 AWG)	3.71	6.15	95	500

CARACTERÍSTICAS ELÉCTRICAS

Resistencia conductor central a c.d. Ω/km	Impedancia característica Ω	Velocidad de propagación %	Capacitancia pF/m	Atenuación MHz	Atenuación dB/100 m
64.3	75±3	66	68	10	3.6
				100	11.3
				200	16.4
				400	23.2
				700	31.6
				1,000	39.5

RG 59 B/U-80%

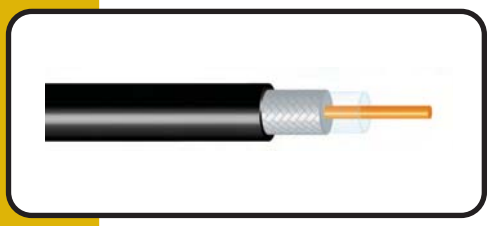


DESCRIPCIÓN:
- Conductor de cobre sólido.
- Aislamiento de polietileno sólido.
- Malla de cobre.
- Cubierta de PVC color negro.

APLICACIÓN:
TV en circuito cerrado, antenas de TV abierta VHF (2 al 13).

Código	Longitud de empaque m	Peso kg/km	Conductor central Resistencia a c.d. nominal	Diámetro aislamiento mm	Diámetro exterior mm	Cubrimiento de la malla %	Impedancia Ω	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100m
800069	500	48.5	0.574 mm (23 AWG) 64.3 Ω/ km	3.71 (0.146")	6.15 (0.242")	80	75 ± 3	66	72.6	10	3.6
										100	11.3
										200	16.4
										400	23.2
										700	31.6
										1,000	39.5

RG 58/U

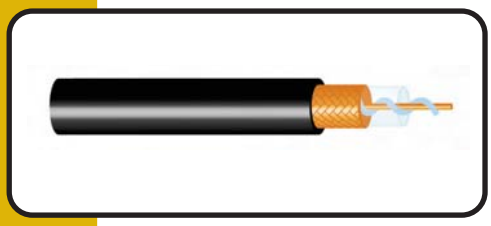


DESCRIPCIÓN:
- Conductor central de cobre sólido.
- Aislamiento de polietileno sólido.
- Malla de cobre estañado.
- Cubierta de PVC color negro.

APLICACIÓN:
Antenas en automóviles, redes THIN-ETHERNET para datos.

Código	Longitud de empaque m	Peso kg/km	Conductor central Resistencia a c.d. nominal	Diámetro aislamiento mm	Diámetro exterior mm	Cubrimiento de la malla %	Impedancia Ω	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100m
800021	500	39	0.81 mm (20 AWG) 33.23 Ω/ km	3.07 (0.121")	4.95 (0.195")	95	53.5 ± 2	66	94	10	4.0
										100	13.0
										200	18.5
										400	28.0
										700	38.5
										900	45.0
										1,000	48.0

RG 62/U

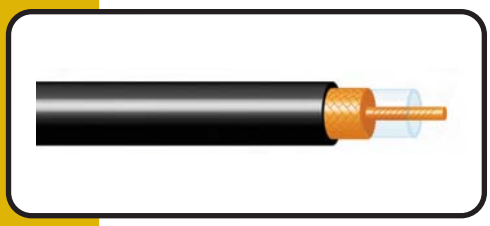


DESCRIPCIÓN:
- Conductor de acero recubierto con cobre.
- Separador helicoidal de polietileno.
- Aislamiento de polietileno sólido tubulado.
- Malla de cobre.
- Cubierta de PVC color negro.

APLICACIÓN:
Antenas en automóviles, algunas redes para datos particulares.

Código	Longitud de empaque m	Peso kg/km	Conductor central Resistencia a c.d. nominal	Diámetro aislamiento mm	Diámetro exterior mm	Cubrimiento de la malla %	Impedancia Ω	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100m
800004	500	50	0.64 mm (22 AWG) 252.6 Ω/ km	3.53 (0.139")	6.0 (0.236")	95	93 ± 4	84	43.4	10	3.0
										100	9.0
										200	12.6
										400	17.4
										700	24.0
										900	26.9
										1,000	28.4

RG 8/U

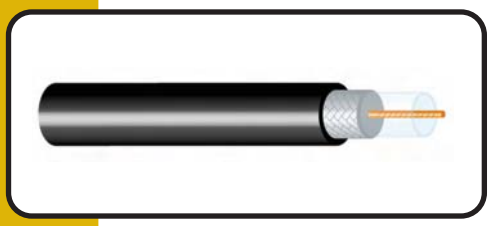


DESCRIPCIÓN:
- Conductor multifilar de cobre.
- Aislamiento de polietileno sólido.
- Malla de cobre.
- Cubierta de PVC color negro.

APLICACIÓN:
Antenas para radios transmisores o telefonía celular.

Código	Longitud de empaque m	Peso kg/km	Conductor central Resistencia a c.d. nominal	Diámetro aislamiento mm	Diámetro exterior mm	Cubrimiento de la malla %	Impedancia Ω	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100m
800027	500	147	2.15 mm (7/21 AWG) 6.66 Ω/ km	7.42 (0.292")	10.4 (0.409")	90	50±2	66	98.9	10	1.8
										100	6.1
										200	8.8
										400	13.3
										700	21.2
										900	25.2
										1,000	26.3

RG 174

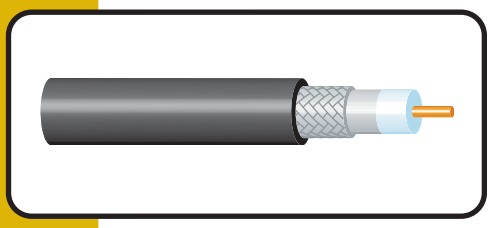


DESCRIPCIÓN:
- Conductor multifilar de cobre.
- Aislamiento de polietileno sólido.
- Malla de cobre estañado.
- Cubierta de PVC.

APLICACIÓN:
Antenas de equipo portátil y usos varios en electrónica.

Código	Longitud de empaque m	Peso kg/km	Conductor central Resistencia a c.d. nominal	Diámetro aislamiento mm	Diámetro exterior mm	Cubrimiento de la malla %	Impedancia Ω	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100m
808216	760	15.5	0.40 mm (7/34 AWG) 124.9 Ω/ km	1.52 (0.060")	3.0 (0.119")	93	50 ± 2	66	99	10	10.5
										100	26.4
										200	40.3
										400	61.0
										700	86.7
										900	99.2
										1,000	109.5

CECBV 75-2



DESCRIPCIÓN:
- Conductor sólido de cobre.
- Aislamiento de polietileno celular.
- Cinta de poliéster aluminizado.
- Malla de cobre estañado en calibre 34 AWG.
- Cubierta de PVC negro.

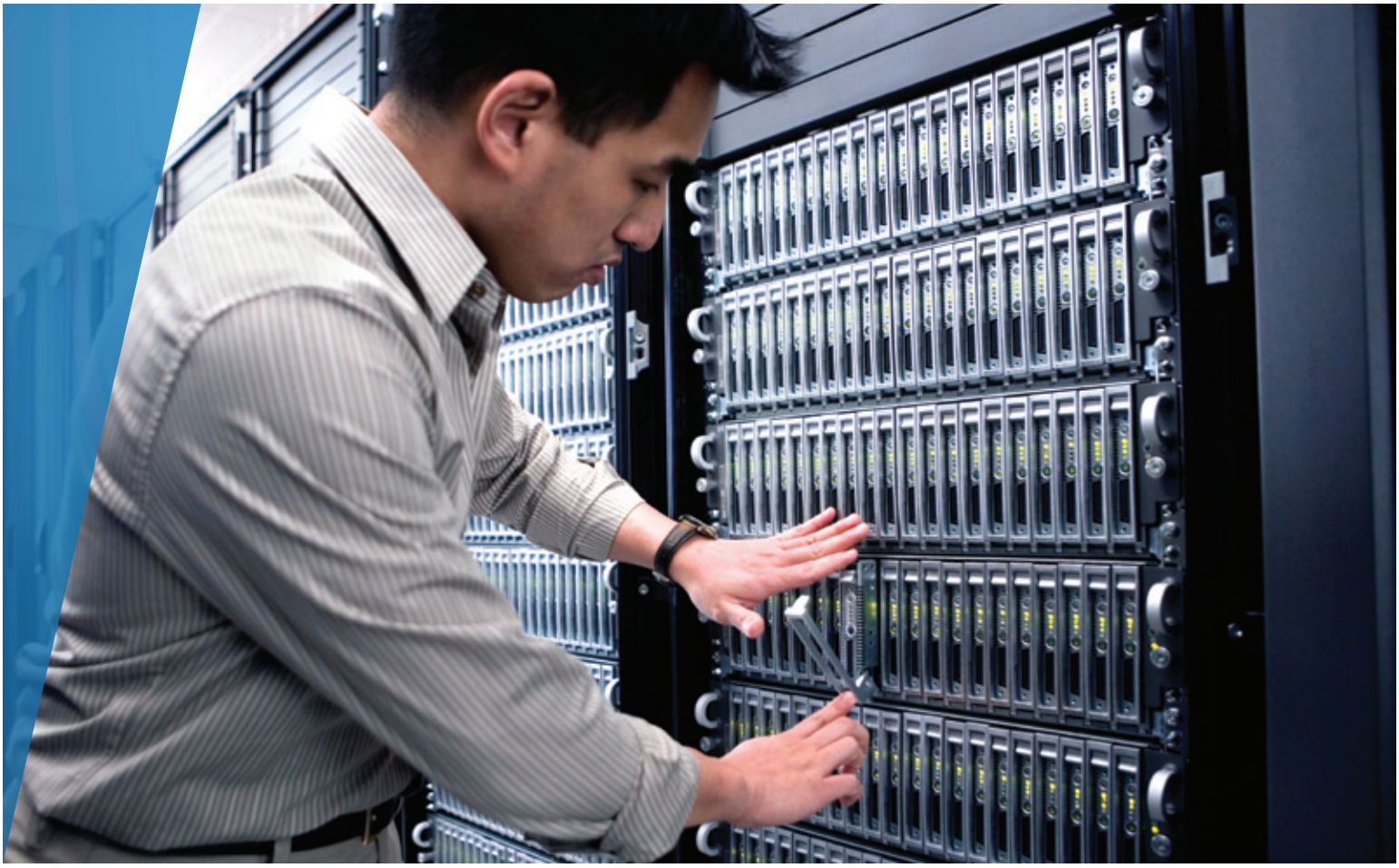
APLICACIONES:
Distribución de señales digitalesen centrales telefónicas, conexión de equipo PCM, o RDI.

ESPECIFICACIONES:
TM 239889-8

Código	Longitud de empaque	Peso neto kg/km	Diámetro del conductor central	Diámetro de aislamiento mm	Diámetro externo mm	Cobertura de la malla %	Adherencia malla-cubierta N
802004	500 m	31	0.404 mm (26 AWG)	2.0 (.079")	4.0 (0.158")	95	10 a 35

Resistencia conductor central a c.d.	Impedancia Ω	Pérdida por retorno estructural mínima (dB)	Velocidad de propagación %	Capacitancia nominal pF/m	Atenuación @ MHz	Atenuación dB/100 m
137 Ω/km	75±3	30 de 15 a 90 MHz 25 de 90 a 200 MHz	78	58±3	1.02	1.7
					4.22	3.4
					17.18	6.8
					22.36	7.8
					77.76	14.7
					137.00	19.8
					200.00	24.2

Nota: Algunos códigos pueden aparecer con dígitos aadicionales, alfanuméricos. estos se usan para identificar al cliente o características adicionales al producto estándar.



Microsoft Windows Server 2008 R2 on HP Converged Infrastructure

Integrated, comprehensive solutions for greater efficiency and productivity

Data sheet

HP and Microsoft® solutions

HP and Microsoft bring together one of the world's leading hardware and software innovations, applications, resources, and support to help you and your business be more productive, achieve more from your investment, and keep your business running smoothly. For more than 25 years, we've been successful at working collaboratively, investing considerable resources in technology, engineering, support, and programs.

Through this partnership, we are dedicated to developing and delivering highly scalable industry-standard information technology in both core businesses and new strategic markets while offering unmatched ownership satisfaction and value. We also combine our respective strengths to bring you complete confidence around integrated technology solutions and world-class service that improve performance, reliability, scalability, and efficiency.

Microsoft
FRONTLINE PARTNERSHIP

About Windows® Server 2008 R2

Windows Server 2008 R2 builds upon the award-winning foundation of Windows Server 2008, expanding existing technology and adding innovations that enable you to quickly save money and improve efficiency. New virtualization tools, Web resources, management enhancements, and exciting Windows 7 integration help you increase the reliability, flexibility, and efficiency of your converged infrastructure. It also includes:

- Built-in hypervisor and live migration
- Windows 7 services such as BranchCache, DirectAccess, and Remote Desktop Services
- Power management to reduce power consumption up to 18%[1]

Why HP for Windows Server 2008 R2?

With HP and Microsoft, one of the world's leading technology brand meets the world's leading operating system. Together, we provide best-of-brand solutions that meet your needs on many different levels. More businesses trust to run their Windows Server and other environments on HP servers. And together we are committed to delivering integrated technologies that drive all aspects of your business. This partnership includes tight integration with HP server, storage, and networking platforms, enabling continuous uptime, as well as management tools used to maintain complex environments and automate resource-intensive tasks and services.

Here are some of the reasons why you should run Windows Server 2008 R2 on HP converged infrastructure:

- We sells more x86 Windows-based deployments than any other company in the world.[2]
- HP can give your business proven 64-bit certified server solutions to meet your business needs. For more information, visit **www.hp.com/go/windowscert**.
- HP builds on Microsoft's live migration capability with automatic failover and failback of HP StorageWorks CA/CLX software across Microsoft Windows Server 2008 R2.
- HP is a four-time Microsoft Worldwide Enterprise Alliance Partner of the Year.[3]
- HP ProLiant systems are designed to operate reliably for years of constant use and are thoroughly tested with Windows operating systems and solutions.
- HP ProLiant is a preferred development platform for Microsoft server products.
- HP ProLiant is a leading platform for virtualized server environments, with tools for easy deployment, unified server hardware and application management, built on energy-efficient technology.
- HP Integrity servers provide customers with highly scalable platform for mission-critical server and database consolidation—up to 256 logical processors, 2 terabytes of memory, and 192 I/O slots. Visit **www.hp.com/go/integrity/windows**
- HP Insight Control for Microsoft System Center and HP Insight software provide powerful management capabilities to help you unlock your infrastructure's potential with deeper insight, more precise control, and ongoing enhancement so you get more from the time, money, and energy resources invested. For more information, visit **www.hp.com/go/insightcontrol**
- HP simplifies sizing and configuration tasks, based on your specific application requirements, with HP ActiveAnswers. Our engineering and integration testing help you use your HP infrastructure investment quickly and effectively. We also supplement these server and storage sizing tools with reference configurations, performance improvement insights, benchmarks, best practices, and solution white papers. Windows Server 2008 R2 and Exchange 2010 materials are coming soon. For more information, visit **www.hp.com/go/activeanswers**
- HP StorageWorks is innovating storage to give you breakthrough savings, extreme flexibility, and total confidence. With over 30 years of experience in the storage business, we're bringing industry-standard server leadership and economies of scale to the world of storage to help you easily deploy, enhance, and protect Microsoft server deployments. Plus, you can manage more and adapt easily in a physical or virtualized environment—with less budget, time, and energy.

[1] Internal Microsoft study comparing Windows Server 2003 SP2 and Windows Server 2008 R2 on an HP DL585 G5 (Shanghai processor).

[2] IDC WW Q109 Server Tracker.

[3] HP was named Microsoft Enterprise Alliance Partner of the Year in 2007, 2005, 2003, and 2000.

- Virtualize storage for Windows Server R2 environments with HP LeftHand P4000 SAN Solutions or HP StorageWorks Enterprise Virtual Arrays (EVAs). HP LeftHand SANs can lower costs by up to 50 percent and improve capacity utilization by up to 33 percent.[4] The solutions also scale nondisruptively to meet the high levels of data availability virtualized applications often demand. HP EVAs offer up to 50 percent lower administrative costs compared to traditional disk arrays.[5]
- HP servers and storage are the leading hardware infrastructure for Microsoft Exchange Server, SQL Server, and SharePoint Server as well as many other industry-standard business applications.[6]
- Reduce networking real estate by up to 75 percent with HP Virtual Connect (VC) architecture; with HP Flex-10 technology, this industry-leading combination can reduce hardware costs by up to 50 percent and maintenance costs by up to 80 percent. **http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-6520ENW.pdf**
- HP provides a sizing tool for Hyper-V R2 that helps you quickly assess server and storage needs for virtualizing your environment. The tool is flexible in its acceptance of user requirements and supports input from the Microsoft Assessment and Planning (MAP) toolkit.
- HP offers a complete portfolio of infrastructure design, migration, and implementation support and services for Windows Server operating systems running on HP infrastructures.

HP certification and support for Windows Server 2008 R2

You can search for HP certifications for ProLiant ML, DL, SL, and BL servers as well as Integrity servers on the Microsoft Windows Server Catalog (visit **www.windowsservercatalog.com**). For ProLiant servers, you can also view the **HP ProLiant OS Support Matrix** (**www.hp.com/go/windowscert**). ProLiant platforms are the first to be certified (only at the time of this publication) for the new Microsoft Windows Server 2008 R2 Power Additional Qualifier.

You can download drivers from **www.hp.com** by clicking the "Support and Drivers Link". This link provides a path to download drivers for both ProLiant and Integrity servers by product family and by series of server. Once the exact server is located, you will find Windows Server 2008 R2 drivers available for download. Drivers for HP ProLiant and BladeSystem servers can be also found by clicking on the server name in the **HP ProLiant OS Support Matrix.** You can also search for HP certifications for StorageWorks products on the Microsoft Windows Server Catalog (visit **www.windowsservercatalog.com**) or by viewing the HP Single Point of Connectivity Knowledge (SPOCK) Web site (visit **http://h20272.www2.hp.com**; an HP Passport account is required to enter the SPOCK website).

HP Insight software support

Get more from every hour, watt, and dollar that you invest in your infrastructure—physical and virtual. HP Insight software unlocks the potential of your infrastructure to help you make more informed decisions, accomplish more in less time, and deliver better service to your business.

HP Insight Control is essential infrastructure management software, giving you total control of your server infrastructure—onsite or remotely. With a single, easy-to-use management console, you can proactively monitor server health and performance. You can also deploy new servers quickly and manage virtual machines—which means increased flexibility to quickly respond to your business. The savings are tangible—up to $ USD 48,380 per 100 users.[7]

Providing advanced infrastructure management, **HP Insight Dynamics** helps you continuously analyze and improve your converged infrastructure. This software is one of the world's first integrated solution that lets you visualize, plan, and change physical and virtual resources in the same way. It makes your infrastructure change-ready, with the freedom and flexibility of virtualization delivered across your physical infrastructure.

HP Insight Software support for Windows Server 2008 R2 includes HP Insight Foundation Suite for ProLiant and Insight Control 6.0, as well as Insight Dynamics 6.0

[4] Calculation based on aggregate best practice guidelines.

[5] "Comparative Management Cost Survey; Workload Weighting for Mid-range Storage Array Administrators," Edison Group, February 2009; sponsored by HP.

[6] 2008 Radicati Group market share study.

[7] IDC: Gaining Business Value and ROI with HP Insight Control, May 2009.

Why HP

HP provides you with a comprehensive range of proven server and storage offerings to run Microsoft software solutions with ease and efficiency. We give you the choice you demand to best meet your business and IT requirements. We work closely with Microsoft in the integration and testing of our combined solution offering, so you can take advantage of standards-based, quality offerings that you can rely on. We also offer a wide variety of services to help you meet your objectives throughout the entire product life cycle.

For more information

To answer any questions you have about running Windows Server 2008 R2 on HP Converged Infrastructure, contact your HP representative or visit the following sites for more information:

HP Windows Server 2008 R2:
www.hp.com/go/ws2008r2

Microsoft Windows Server 2008 R2:
www.microsoft.com/windowsserver2008

HP ProLiant Server Support for Windows Server:
www.hp.com/go/ossupport

HP Integrity servers:
www.hp.com/go/integrity/windows

HP ProLiant servers: **www.hp.com/go/proliant**

HP Storage Solutions for Microsoft:
www.hp.com/storage/microsoft

HP Care Pack services: **www.hp.com/services**

For additional technical specifications, please visit
www.hp.com/go/ws2008r2

HP Services

HP can provide technical support for your HP infrastructure and Microsoft Windows Server software, with HP Care Pack services that let you choose the level and priority of support—making it fast and easy to resolve problems if they arise. HP Services offers a complete portfolio of comprehensive services and cost-saving updates to help you enhance the performance and availability of software from HP and other leading vendors. Services can be configured for OS-only support, or can be configured to support the OS plus the standard Microsoft Windows Server applications installed on the server.

- **Standard Support** gives your IT team direct access to HP IT Response Centers. Support is available throughout standard business hours on standard business days.
- **HP 24x7 Software Technical Support** provides comprehensive around-the-clock services and cost-saving updates to help you enhance the performance and availability of software from HP and other leading vendors.
- **HP Support Plus** delivers onsite hardware support and over-the-phone software support 13 hours a day, 5 days a week. Service coverage encompasses HP products and selected multivendor hardware and software.
- **HP Support Plus 24** delivers onsite hardware support and over-the-phone software support around-the-clock 365 days a year.
- **HP Proactive 24** delivers onsite hardware support and over-the-phone software support, plus proactive problem identification and solutions recommendation, with remote monitoring, and an assigned account manager to manage the proactive services.
- **HP Critical Service** delivers onsite hardware support and over-the-phone software support, plus proactive problem identification and solutions recommendation, with remote monitoring, and an assigned support team to manage the proactive services.
- **HP Installation and Startup Services** makes certain that your new HP hardware or software is installed smoothly, efficiently, and with minimal disruption of your IT and business operations.

Share with colleagues

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4AA2-9552ENW, Created October 2009; Updated July 2010, Rev. 1

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What the f70 Monitor Offers
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Setting Up the Monitor
How to Install the Drivers
Adjusting the Monitor
Using the Monitor
Troubleshooting
LCD Monitor Quality and Pixel Policy for f50 Monitor
LCD Monitor Quality and Pixel Policy for f70 Monitor
Technical Specifications for the f50 Monitor
Technical Specifications for the f70 Monitor
HP f70 Audio System Performance Specifications
Care and Cleaning
Environmental Information
Regulatory Information

hp pavilion f50/f70 D5063/D5064 15-inch/17-inch LCD Monitor

(15-inch/17-inch Viewable Image)

User's Guide

Notice

The information contained in the documents accompanying this product is subject to change without notice.

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USA

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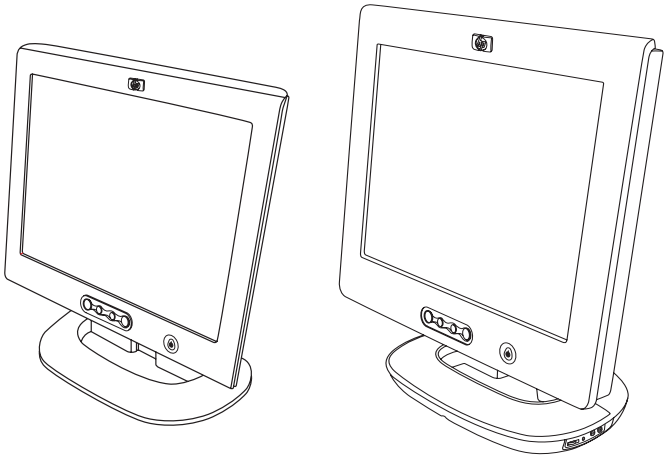
f50 15-inch LCD Monitor **f70 17-inch LCD Monitor**



hp pavilion f50/f70 D5063/D5064 15-inch/17-inch LCD Monitor

(15-inch/17-inch Viewable Image)

User's Guide

Important Safety Instructions

CAUTION: **The lightning flash with arrowhead symbol inside an equilateral triangle is intended to alert the user to the presence of uninsulated, dangerous voltage which may be of sufficient magnitude to constitute a risk of electric shock.**

WARNING: **The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and servicing instructions in the literature accompanying the appliance.**

WARNING: **If you are unsure that you can lift the equipment safely, do not try to move it without help.**

WARNING: **Before you connect any cables or install the HP monitor, refer to the above safety instructions. Also, refer to the set up poster and the documentation included with the PC and the video adapter to ensure this equipment is correctly installed.**

WARNING: **For your safety, always connect equipment to a grounded wall outlet. Always use a power cord with a properly grounded plug, such as the one provided with the equipment, or one in compliance with your national safety standards. This equipment can be disconnected from the power by removing the power cord from the power outlet. This means the equipment must be located close to an easily accessible power outlet.**

WARNING: **Use the monitor with the power adapter supplied with your HP monitor only.**

To avoid electrical shock, do not open the monitor cover or the power adapter. There are no user-serviceable parts inside. Only qualified service personnel should service these parts.

Make sure the computer is turned off before connecting or disconnecting a display peripheral.

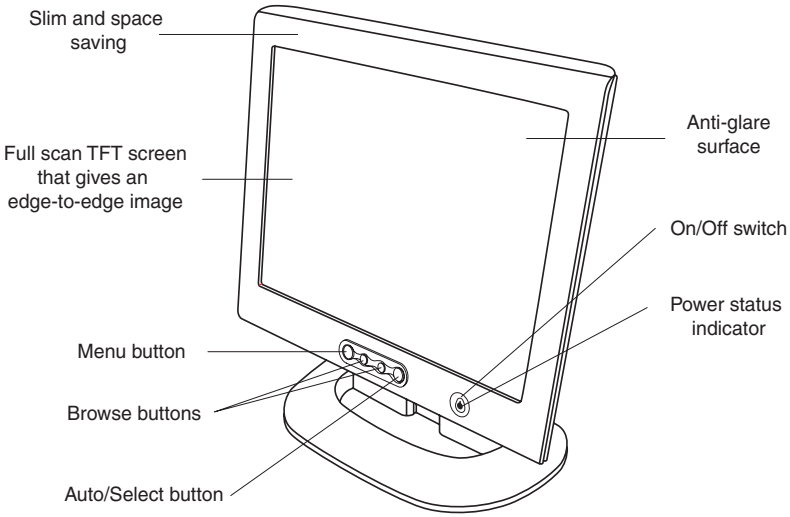
Working in Comfort

Thank you for selecting HP monitor equipment.

To optimize your comfort and productivity, it's important that you set up your work area correctly and use your HP equipment properly. With that in mind, we have developed some setup and use recommendations based on established ergonomic principles for you to follow.

These recommendations can be found in the online version of the Working in Comfort guide, which is preloaded on the hard disk of your HP computer. They can also be found on the HP Working in Comfort Web site at http://www.hp.com/ergo/ along with other information.

What the f50 Monitor Offers



The HP f50 monitor is a liquid crystal display (LCD) 15-inch, high resolution, multi-synchronous color monitor. *Multi-synchronous* means that the monitor can be used with a range of video modes. It is optimized for use with all HP computers.

The HP f50 monitor has the following features:

- A 15-inch LCD; thin film transistor (TFT) with an anti-glare surface
- Support of video modes up to 1024 x 768 at a 75 Hz refresh rate
- Analog/Digital interface: a VGA (analog) and a DVI-D (digital) connector enables connection to two computers at the same time (optional)
- True color (16 million colors)
- Auto-adjustment of display position, clock, and phase for the VGA interface
- An onscreen display (OSD) manager that allows you to adjust all settings through onscreen menus

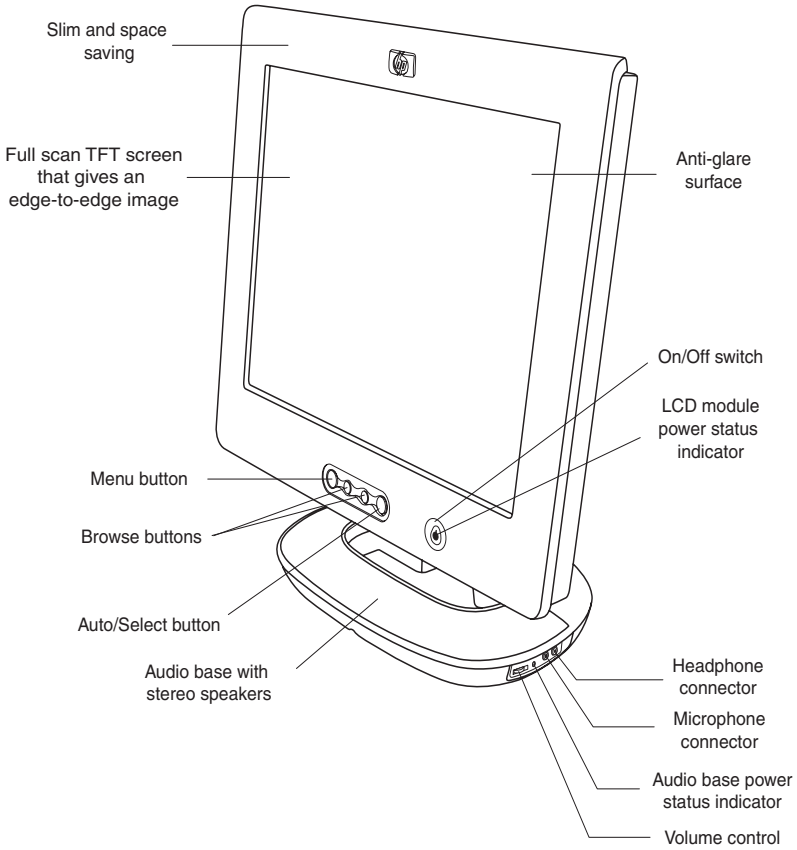
- Power-management system (VESA[1] standard) controlled from suitably equipped HP computers to automatically reduce the power consumption of the monitor

NOTE: *As an ENERGY STAR partner, HP has determined that this product meets ENERGY STAR guidelines for energy efficiency.*

- Low power consumption: 36 W maximum
- Compliance with stringent Swedish Low Emissions guidelines TCO '99
- Plug and Play capability (compliant with VESA DDC standard, version 3, revision 1 at the levels DDCI, DDC/2B, DDC/C1, version 1) that enables the monitor to identify itself to suitably equipped HP computers

1. VESA is the Video Electronics Standards Association.

What the f70 Monitor Offers



The HP f70 monitor is a liquid crystal display (LCD) 17-inch, high resolution, multi-synchronous color monitor. *Multi-synchronous* means that the monitor can be used with a range of video modes. It is optimized for use with all HP computers.

The HP f70 monitor has the following features:

- A 17-inch LCD; thin film transistor (TFT) with an anti-glare surface
- Support of video modes up to 1280 x 1024 at a 75 Hz refresh rate
- Analog/Digital interface: a VGA (analog) and a DVI-D (digital) connector enables connection to two computers at the same time (optional)
- True color (16.7 million colors)
- Auto-adjustment of display position, clock, and phase for the VGA interface
- Audio base with Polk Audio active stereo speakers
- All-in-one audio and microphone cable
- An onscreen display (OSD) manager that allows you to adjust all settings through onscreen menus
- Power-management system (VESA[2] standard) controlled from suitably equipped HP computers to automatically reduce the power consumption of the monitor

NOTE: *As an ENERGY STAR partner, HP has determined that this product meets ENERGY STAR guidelines for energy efficiency.*

- Plug and Play capability (compliant with VESA DDC standard, version 3, revision 1 at the levels DDCI, DDC/2B, DDC/C1, version 1) that enables the monitor to identify itself to suitably equipped HP computers
- Slot for security lock

2. VESA is the Video Electronics Standards Association.

Unpacking the Monitor

Check for the following items. If they are missing or damaged, consult your retailer immediately.

- 1 liquid crystal display (LCD)
- 1 power cord
- 1 DC adapter with an attached DC cable
- 1 video cable (VGA)
- 1 video cable (DVI-D) (select models only)
- 1 *Quick User's Guide*
- 1 warranty booklet
- 1 CD-ROM disc

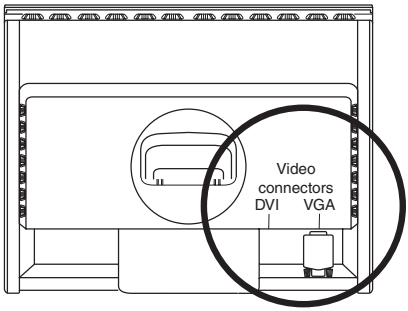
Setting Up the Monitor

Place the monitor on a flat, sturdy surface. Ensure that the operating site is free from excessive heat and moisture. For best performance, make sure nothing is resting on the monitor.

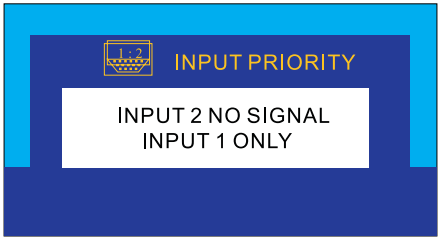
WARNING: **Before you connect any cables or install the HP monitor, refer to the safety instructions at the beginning of this manual. Refer also to the documentation that came with the computer to ensure this equipment is correctly installed.**

Connecting two computers to the monitor

The LCD monitor has two video signal connectors on the rear panel: one analog (VGA) and one digital (DVI-D). This allows you to connect the monitor to two computers at the same time.

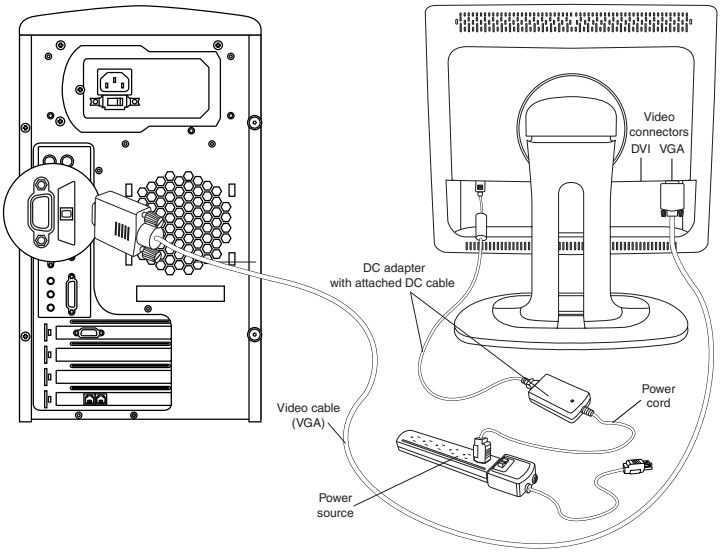


When two computers are connected, you need to use the Input Priority setting on the onscreen display (OSD) to switch from one video signal to the other. See "Input Priority" on page 33. The LCD must be set to one signal or the other to operate properly.



Connecting the cables to the f50 monitor

Look at the following diagram and follow the steps listed below to connect the cables to the f50 15-inch LCD monitor.



CAUTION: **This monitor is equipped with an auto-sensing power supply for voltage ranges 100–240 V~, 50/60 Hz. Use the monitor with the supplied DC adapter only.**

To connect the cables to the f50 monitor:

1 Make sure the computer is turned off.

2 Plug the video cable into the correct video connector (VGA or DVI-D) on the back of the monitor and into the corresponding video connector on the computer. Secure the cable by tightening the thumbscrews.

VGA cable →	VGA connector
DVI-D cable →	DVI-D connector

NOTE: *The f50 monitor comes with both a VGA and a DVI-D connector. Some models come with a VGA cable, and others come with a DVI-D cable as well. Using both video connectors, you can connect this monitor to two computers at the same time. You may need to purchase the DVI-D cable.*

3 Plug the DC adapter cable into the connector on the back of the monitor.

4 Plug the power cord into the DC adapter and into the main power source.

5 Turn on the main power source (for example, a surge protector), and then turn on the power switch for both the computer and the monitor.

To disconnect the cables from the f50 monitor:

1 Turn off the power switch for the monitor and the computer and then turn off the main power source.

2 Disconnect the power cord from the main power source and from the DC adapter cable.

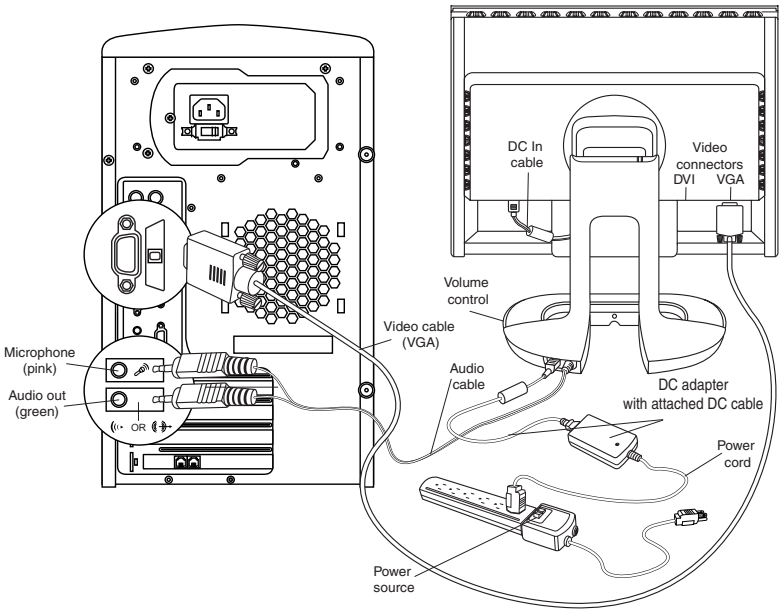
3 Disconnect the DC adapter cable from the connector at the back of the monitor.

4 Unscrew the thumbscrews on the video cable(s) and disconnect the video cable(s).

Connecting the cables to the f70 monitor

Look at the following diagram and follow the steps listed below to connect the cables to the f70 17-inch LCD monitor.

CAUTION: **This monitor is equipped with an auto-sensing power supply for voltage ranges 100—240 V~, 50/60 Hz. Use the monitor with the supplied DC adapter only.**



To connect the cables to the f70 monitor:

1 Make sure the computer is turned off.

2 Plug the video cable into the correct video connector (VGA or DVI-D) on the back of the monitor and into the corresponding video connector on the computer. Secure the cable by tightening the thumbscrews.

VGA cable →	VGA connector
DVI-D cable →	DVI-D connector

NOTE: *The f70 monitor comes with both a VGA and a DVI-D connector. Some models come with a VGA cable, and others come with a DVI-D cable as well. Using both video connectors, you can connect this monitor to two computers at the same time. You may need to purchase the DVI-D cable.*

3 Plug the audio cable into the correct connectors on the computer. Connect the green plug to the Audio Out connector and the pink plug to the Microphone connector on the computer.

green → Audio Out connector	
pink → Microphone connector	
Speaker Out connector	

CAUTION: **Do not connect the audio cable to the Speaker Out connector on the computer: the audio system of the monitor could be damaged. The audio cable must be connected to the Audio Out connector. HP recommends you keep the audio cable connected to the Audio Out connector on the computer at all times when using the f70 monitor.**

4 Plug the DC adapter cable into the connector at the rear of the monitor base.

5 Plug the power cord into the DC adapter.

6 Make sure the DC In cable is connected from the back of the monitor column to the back of the LCD panel. This cable should always be connected.

7 Make sure the volume is turned to the minimum setting on both the audio base and on the keyboard (if the keyboard has a volume control feature).

NOTE: *For the best performance and sound range of the f70 monitor, use the keyboard for the primary volume control and use the audio base as a secondary volume control.*

8 Turn on the main power source (for example, a surge protector), and then turn on the power switch for both the computer and the monitor.

NOTE: *The audio base is always on when the monitor is connected to a power source, even when the computer and the LCD panel are turned off. To see if the monitor is receiving power, check the power status indicator (LED) on the side of the audio base and check the light indicator on the front of the LCD panel.*

To disconnect the cables to the f70 monitor:

1 Turn off the power switch for the monitor and the computer, and then turn off the main power source.

2 Disconnect the power cord from the main power source and the DC adapter cable.

3 Disconnect the DC adapter cable from the connector at the rear of the monitor base.

4 Disconnect the audio cable from the computer connectors.

5 Unscrew the thumbscrews on the video cable(s) and disconnect the video cable(s).

Connecting the speakers to the f70 monitor

The f70 monitor comes with two built-in stereo speakers in the audio base. If you bought the monitor with an HP Pavilion home PC, you will have two sets of speakers: an external set shipped with the computer, and a built-in set that is part of the monitor.

The external speakers of the computer connect to a Speaker Out connector identified on the set up poster for the computer. These speakers will provide the best sound for most HP Pavilions.

If you want to use the built-in monitor speakers, you must connect them to a Line Out or an Audio Out connector on the back of the computer. Use the audio cable provided for connecting the built-in monitor speakers and the microphone to the computer; see step 3 in “Connecting the cables to the f70 monitor” on page 14.

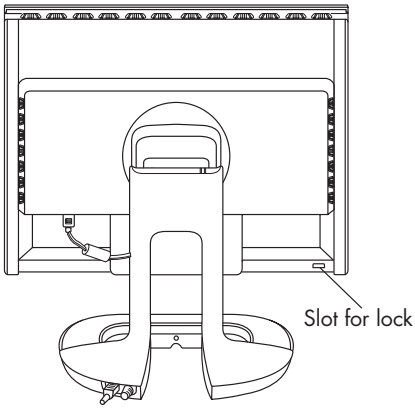
If the computer does not have a Line Out or Audio Out connector, you can purchase a sound card with a Line Out connector to use the internal monitor speakers.

If you are not sure which connector you have and the sound quality is poor, make sure the external PC speakers are connected to the Speaker Out connector and not the Audio Out connector. Make sure the audio cable from the monitor is not connected to the Speaker Out connector on the computer.

Securing the f70 monitor

The f70 monitor can be secured to a desk or to any other fixed object, using a Kensington lock security cable. The cable can be attached to a slot located on the rear of the monitor.

NOTE: *The Kensington lock is not an HP accessory. It cannot be ordered from HP. Contact your retailer for more information.*



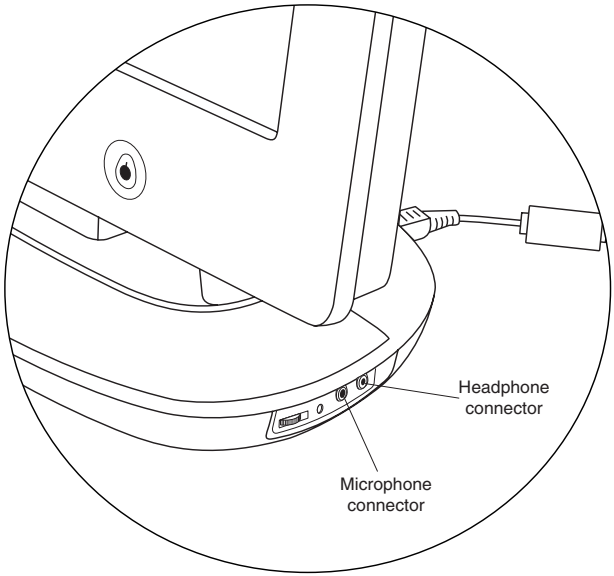
To secure the monitor:

1 Insert the lock in the slot located on the rear of the monitor.
2 Turn the key to lock the cable to the monitor.
3 Remove the key and store it in a safe place.

Connecting additional devices to the f70 monitor

The following diagram shows additional devices that can be connected to the monitor. On the side of the audio base, the f70 monitor has one headphone connector and one microphone connnector. You can use these connectors to connect various compatible devices.

Headphone connector	
Microphone connector	



How to Install the Drivers

The HP monitor comes with driver software that allows you to take advantage of the Plug and Play feature of the Windows® Me, Windows 2000, or Windows XP operating system. This software enables the computer to communicate with the monitor and use all the monitor features. Without this software, the monitor settings and display images will not be correct.

NOTE: *HP computers may ship with the Plug and Play drivers preinstalled. If you have an older computer, these drivers may not be preinstalled and you may need to install the drivers from the CD-ROM disc that came with the monitor.*

You can also download the latest version of a driver from the HP Monitors Support Web site at:
http://www.hp.com/go/monitorsupport/

Windows 2000 Users

NOTE: *The procedure for installing the driver for your operating system may vary.*

To install the driver for the f50 or f70 monitor:

1 Click **Start**, select **Settings**, and then click **Control Panel**.
2 Double-click **Display**.
3 Click the **Settings** tab.
4 Click **Advanced Properties** or **Advanced**, and select the **Monitor** tab.
5 Click **Properties**.
6 Click the **Driver** tab.
7 Click **Update Driver** and click **Next**.
8 Select the recommended option and then click **Next**.
9 Select the **Specify a Location** box.
10 Find and open the **f50.inf** (f50 15-inch) or the **f70.inf** (f70 17-inch) file on the CD-ROM disc in the Drivers directory, and click **OK**.
11 Click **Next** to install the selected monitor.

Windows Me Users

NOTE: *The procedure for installing the driver for your operating system may vary.*

To install the driver for the f50 or f70 monitor:

1 Click **Start**, select **Settings**, and then click **Control Panel**.
2 Click **Display**.
3 Select the **Settings** tab.
4 Click the **Advanced** button.
5 Select the **Monitor** tab.
6 Click the **Change** button.
7 Select the **Specify a Location** box.
8 Find and open the **f50.inf** (f50 15-inch) or the **f70.inf** (f70 17-inch) file on the CD-ROM disc in the Drivers directory, and click **OK**.
9 Click **Next** to install the selected monitor.

Windows XP Users

NOTE: *The procedure for installing the driver for your operating system may vary.*

To install the driver for the f50 or f70 monitor:

1 Click **Start**.
2 Click **Control Panel**.
3 Click **Appearance and Themes**.
4 Click **Display**.
5 Select the **Settings** tab.
6 Click the **Advanced** button.
7 Select the **Monitor** tab.
8 Click **Properties**.
9 Select the **Driver** tab.
10 Click **Update Driver** and click **Next**.
11 Select the recommended option and then click **Next**.
12 Select the **Specify a Location** box.

13 Find and open the **f50.inf** (f50 15-inch) or the **f70.inf** (f70 17-inch) file on the CD-ROM disc in the Drivers directory, and click **OK**.

14 Click **Next** to install the selected monitor.

If the installation procedure of the monitor driver for the Windows 2000, Windows Me, or Windows XP operating system is different, or if you need more detailed installation information, please refer to the Microsoft Windows information that came with the computer.

Adjusting the Monitor

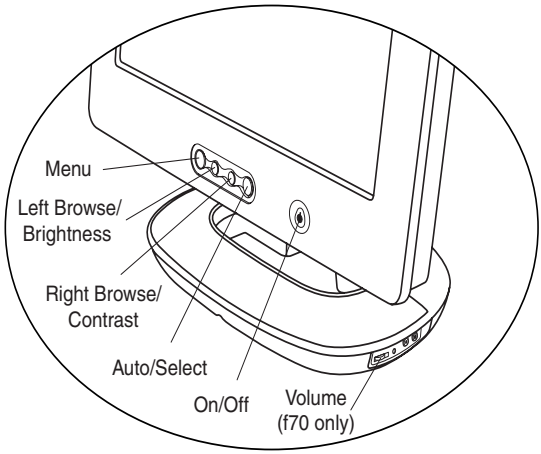
The monitor display has several adjustable settings which may need to be fine-tuned occasionally. Adjust the monitor:

- When the monitor is installed for the first time.
- If the resolution (number of pixels on the display) or refresh rate (vertical scan frequency rate) has been changed.
- If the graphic card has been changed.
- If the monitor is connected to a different computer.
- After using the Mode Recall function. See "To use Mode Recall" on page 31.

NOTE: *For best performance, it is recommended that you select a video mode of 1024 x 768 @ 60 Hz for the f50 monitor and 1280 x 1024 @ 60 Hz for the f70 monitor on the computer.*

Using the monitor controls

There are five controls for the f50 monitor and six controls for the f70 monitor that perform the following operations:



NOTE: *The volume control is available only on the f70 monitor.*

Monitor control buttons

Control button/icon	Function when not in Display Manager	Function in Display Manager
MENU	**Menu:** Opens and closes the Display Manager window	Closes setting screens and exits Display Manager
< ☼	**Left Browse/Brightness:** Shortcut to Brightness setting screen	Navigates through setting option icons and adjusts settings
> ◑	**Right Browse/Contrast:** Shortcut to Contrast setting screen	Navigates through setting option icons and adjusts settings
↵	**Auto/Select:** Performs an auto-adjustment which will optimize the image quality	Acts as an Enter (Select) key to select setting screen options
On/Off	**On/Off:** Turns the monitor on or off	Turns the monitor on or off
Volume control	**Volume control*:** Adjusts volume setting (f70 only)	Adjusts volume setting

***NOTE:** *For the best performance and sound range of the f70 monitor, use the keyboard for the primary volume control and use the audio base as a secondary volume control.*

Auto-Adjustment function

You can easily optimize the screen performance for the VGA interface by using the Auto button and the auto-adjustment pattern on the CD-ROM disc provided.

1 Insert the provided CD-ROM disc into the computer. Run the program D:\F50.exe or D:\F70.exe to display a pattern used for setup.

2 Press the Auto button to produce a stable, centered image.

The optimizer utility on the CD-ROM contains the drivers for Windows Me, Windows 2000, or Windows XP. For the f50 monitor, use the D:\Drivers\f50.inf file. For the f70 monitor, use the D:\Drivers\f70.inf file.

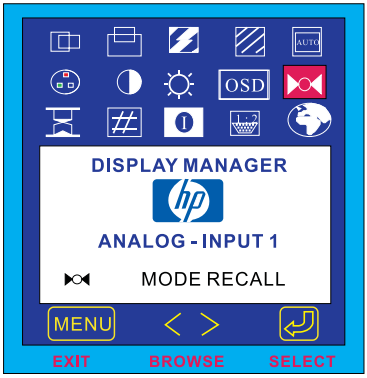
Using the Monitor

Using Display Manager

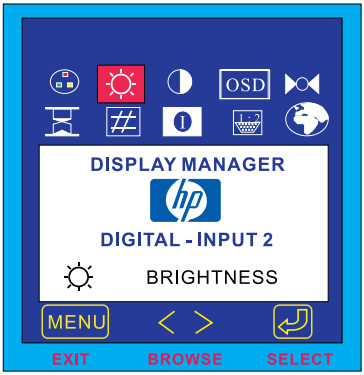
The monitor comes pre-configured to provide the best viewing image. However, you can fine-tune the display using Display Manager. The monitor has control buttons that you can use to open Display Manager to select and adjust display settings.

To adjust display settings:

1. Press the Menu button to open Display Manager.
2. Press a Browse button to navigate through the setting option icons; see the following setting options table.
3. When the menu option you want is selected, press the Select button to open the setting screen for that option.
4. Adjust the setting using the onscreen instructions that follow.
5. To exit Display Manager, press the Menu button.



Display Manager screen in analog mode



Display Manager screen in digital mode

Setting Options

The icons at the top of the Display Manager window represent the different setting options, shown in the following table:

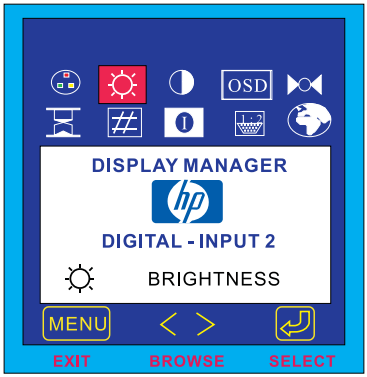
Icon	Setting option	Setting description
	Horizontal Position*	Adjusts the horizontal position of the screen image.
	Vertical Position*	Adjusts the vertical position of the screen image.
	Clock*	Adjusts the frequency of the pixel clock to minimize vertical bars.
	Phase*	Adjusts the phase value to minimize horizontal bars.
	Auto Config*	Adjusts the main settings and produces a stable, centered image.
	Color	Adjusts the tint of white, and the red, green, and blue (RGB) mix for colors.
	Contrast	Adjusts the difference between the light and dark areas.
	Brightness	Adjusts the brightness.
	OSD Manager (OSD stands for onscreen display)	Adjusts the position, timeout, and notification features of the Display Manager window.
	Mode Recall	Resets the display to original factory settings for color, brightness, phase, and clock.
	Backlight Info	Shows the status of the light behind the panel.
	Serial Number	Shows the serial number of the display.
	Mode Info	Shows the current resolution and refresh rate; shows if you're in analog or digital mode; and shows how many user settings have been adjusted.
	Input Priority	Sets which video input is active: analog or digital. Shows status of the video input that is active.
	Languages	Shows the language of the OSD window.

***NOTE:** *Horizontal Position, Vertical Position, Clock, Phase, and Auto Config settings do not need to be adjusted for displays operating in digital mode; therefore these icons do not appear in digital mode.*

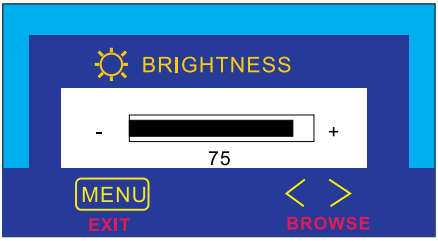
Horizontal Position, Vertical Position, Clock, Phase, Contrast, or Brightness settings

To change Horizontal Position, Vertical Position, Clock, Phase, Contrast or Brightness settings:

1 Open the setting screen you want to adjust. See "Using Display Manager" on page 24.



2 Press the Browse buttons to adjust the setting. The setting is automatically saved as you adjust it.



3 Press the Menu button to exit the setting screen.

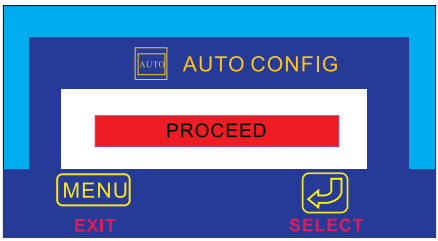
- In the Horizontal Position screen, pressing the left Browse button moves the horizontal position to the left, and pressing the right Browse button moves the horizontal position to the right.
- In the Vertical Position screen, pressing the left Browse button moves the vertical position down, and pressing the right Browse button moves the vertical position up.
- In the Clock screen, pressing the left Browse button sets the clock to an earlier time, and pressing the right Browse button sets the clock to a later time.
- In the Phase screen, pressing the left Browse button decreases phase setting values, and pressing the right Browse button increases phase setting values.
- In the Contrast screen, pressing the left Browse button decreases the contrast, and pressing the right Browse button increases the contrast.
- In the Brightness screen, pressing the left Browse button decreases the brightness, and pressing the right Browse button increases the brightness.

Auto Config settings

With Auto Config you can reset Horizontal Position, Vertical Position, Clock, and Phase to optimize the image quality. When using this option, please view a full Windows screen, such as Windows Explorer, or use the test pattern provided on the CD before pressing the Select button on the Auto Config menu. These test pattern files are named F50.exe and F70.exe.

To change settings with Auto Config:

1 Open the Auto Config setting screen. See "Using Display Manager" on page 24. A window with a red bar appears.



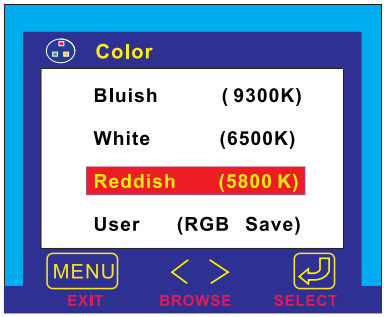
2 Press the Select button to proceed with the reset, or press the Menu button to exit without resetting.

3 If you reset the settings, press the Menu button to exit the setting screen.

Color settings

To change Color settings:

Open the Color setting screen. See "Using Display Manager" on page 24. Four options appear: Bluish, White, Reddish, and User. Bluish, White, and Reddish refer to tints of white. This setting lets you manually adjust the red, green, and blue (RGB) mix for color generation.



To adjust tints of white:

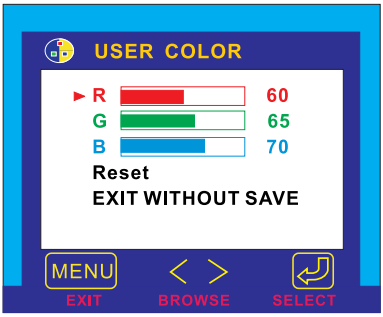
1 Press the Browse buttons to select a tint of white.

2 Press the Menu button to save the tint setting and exit the setting screen.

To adjust User Color:

1 Press the Browse buttons until User is selected.

2 Press the Select button to open the User Color window.



3 Press the Browse buttons to select the color you want to adjust.

4 Press the Select button to activate the adjustable setting for the color.

5 Press the Browse buttons to change the color value. The value is automatically saved as you change it.

6 Press the Menu key to exit the setting screen.

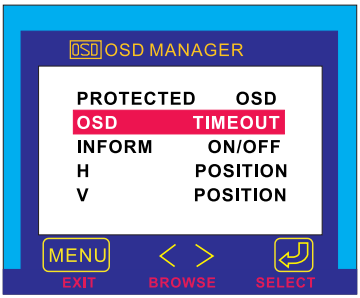
After you change a color value, you can reset the values to the original factory color settings by selecting **Reset** and pressing the Menu key.

You can choose to keep the color values as they were before any adjustments were made by selecting **EXIT WITHOUT SAVE** and pressing the Menu key.

OSD settings

To change OSD settings:

1 Open the OSD setting screen. See "Using Display Manager" on page 24. Five options appear: Protected OSD, OSD Timeout, Inform On/Off, H Position, and V Position.



2 Press the Browse buttons to select the option you want to adjust.

3 Press the Select button to display its setting screen.

NOTE: *Protected OSD is not available for use.*

To adjust OSD Timeout:

You can set the OSD (Display Manager) screen to turn off automatically when you are not using it.

1 Press the Browse buttons to select how long the Display Manager screen appears before automatically turning off. The setting is automatically saved as you adjust it.

2 Press the Menu button to exit the setting screen.

To adjust Inform On/Off:

Turning Inform on displays the chosen resolution and refresh rate for three seconds, whenever you change them. Turning Inform off prevents this information from being displayed.

1 Press the Browse buttons to select On or Off. The setting is automatically saved as you adjust it.

2 Press the Menu button to exit the setting screen.

To adjust OSD H Position:

You can adjust the horizontal position of the OSD (Display Manager) screen.

1 Press the Browse buttons to position the OSD screen. The setting is automatically saved as you adjust it.

2 When the screen is in the horizontal position you want, press the Menu button to exit the setting screen.

To adjust OSD V Position:

You can adjust the vertical position of the OSD (Display Manager) screen.

1 Press the Browse buttons to position the OSD screen. The setting is automatically saved as you adjust it.

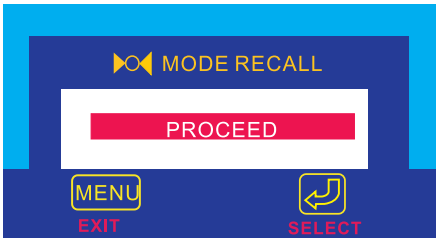
2 When the screen is in the vertical position you want, press the Menu button to exit the setting screen.

Mode Recall

Using Mode Recall restores original factory settings for Color, Brightness, Phase, and Clock. This will re-establish default color settings for the best possible brightness.

To use Mode Recall:

1 Open the Mode Recall setting screen. See "Using Display Manager" on page 24. A window with a red bar appears.



2 Press the Select button to proceed with Mode Recall, or press the Menu button to exit without resetting.

3 If you reset with Mode Recall, press the Menu button to exit the setting screen.

Backlight Info

The Backlight Info window shows the elapsed time of usage for the light behind the display screen. The expected lifespan of the backlight is approximately 30,000 to 40,000 hours. At some point after the maximum usage time of the backlight has been exceeded, you may notice a decrease in brightness of up to 50%. At this point, the backlight needs to be replaced to restore full brightness.

CAUTION: **The backlight can be replaced only by a trained technician. Please contact the HP Support Center for assistance. Do not attempt to replace the light yourself.**

NOTE: *Do not use a screen saver with the LCD monitor, as the backlight will be used. It is recommended that you enable an automatic power saving mode, or switch off the monitor when not in use.*

To view Backlight Info:

1 Open the Backlight Info setting screen. See "Using Display Manager" on page 24. The elapsed time is displayed.

2 Press the Menu button to exit the setting screen.

Serial Number

You may need to provide the display serial number to HP Support technicians to help them serve you better during a Support call.

To view a Serial Number:

1 Open the Serial Number setting screen. See "Using Display Manager" on page 24. The serial number is displayed.

2 Press the Menu button to exit the setting screen.

Mode Info

The Mode Info screen shows whether the current video input mode is analog (1) or digital (2); shows the current resolution and refresh rate; and shows how many User settings you have changed, and how many preset settings have not been changed.

To view Mode Info:

1 Open the Mode Info setting screen. See "Using Display Manager" on page 24. The Video Input mode, the resolution and refresh rate, and the number of Preset and User values are displayed.

2 Select the Preset or User values with the Browse buttons.

3 Press the Select button. The Preset or User mode information screen is displayed.

4 Press the Menu button to exit the setting screen.

Input Priority

You can use this setting to switch between the two video inputs, analog and digital. The default active video input is analog (1). If you are connecting a PC to the digital input (2), you need to change the input priority in the Input Priority screen.

NOTE: *You only need to set the digital input when you connect two PCs to the monitor.*

To set Input Priority:

1 Open the Mode Info setting screen. See "Using Display Manager" on page 24.

2 Press the Browse buttons to switch between Input 1 (analog) and Input 2 (digital).

3 Press the Select button to confirm the new setting. A confirmation screen is displayed.

4 Press the Menu button to exit the setting screen.

Language of Display Manager

You can choose to view Display Manager in English, German, French, Italian, or Spanish.

To change the language of Display Manager:

1 Open the Languages setting screen. See "Using Display Manager" on page 24.

2 Press the Browse buttons to choose the language you would like. The setting is automatically saved.

3 Press the Menu button to exit the setting screen.

Troubleshooting

If you are having trouble with the monitor, these tips may help you solve the problem. Try the following steps before calling HP.
If you find:

No picture and the light indicator on the front of the LCD panel is off:

- Check that the monitor is turned on.
- Check that the power cord is properly connected.
- Check the electrical outlet.
- Connect the monitor to another computer to determine if there is a problem with the computer rather than with the monitor.

No picture and the light indicator on the front of the LCD panel is on:

- Check that the computer is turned on.
- Check that the monitor is not in power-saving mode.
- Adjust the Contrast and Brightness through the onscreen display or the control buttons.
- Check that the video cable has no bent pins.
- Connect the monitor to another computer to determine if there is a problem with the computer rather than the monitor.

Picture is fuzzy:

- Adjust the monitor using the Auto-Adjustment function. See "Auto-Adjustment function" on page 23.
- If you are running the Windows Me, Windows 2000, or Windows XP operating system, install the Plug and Play driver (.inf file). See "How to Install the Drivers" on page 19.
- For the f50 monitor, change the resolution to the recommended resolution of 1024 x 768 @ 60 Hz.
- For the f70 monitor, change the resolution to the recommended resolution of 1280 x 1024 @ 60 Hz.

Pixels are missing:

- See "LCD Monitor Quality and Pixel Policy for the f50 Monitor" on page 36.
- See "LCD Monitor Quality and Pixel Policy for the f70 Monitor" on page 37.

Colors are not pure:

- Check that the video cable has no bent pins and is firmly attached to both the computer and monitor video connectors.
- Restore the original factory colors setting. See "To use Mode Recall" on page 31.
- Adjust the RGB (red, green, and blue) colors. See "To change Color settings" on page 28.

Picture is not centered:

- Adjust the monitor using the Auto-Adjustment function. See "Auto-Adjustment function" on page 23.

No sound (f70 monitor only):

- Check to see that the power status indicator (LED) on the side of the audio base is turned on.
- Make sure the main power supply is turned on.
- Check to see if the audio cable is plugged in properly.
- Adjust the volume setting on the audio base and the keyboard. Make sure the Mute setting on the keyboard and in the Volume Controls of the computer is turned off.

LCD Monitor Quality and Pixel Policy for f50 Monitor

f50 15-inch monitor

The HP f50 TFT monitor uses high-precision technology, manufactured according to HP standards, to guarantee trouble-free performance. Nevertheless, the display may have cosmetic imperfections that appear as small bright or dark spots. This is common to all LCD displays used in products supplied by all vendors and is not specific to the HP D5063 LCD. These imperfections are caused by one or more defective pixels or sub-pixels.

- A pixel consists of one red, one green, and one blue sub-pixel.
- A defective whole pixel is always on (a bright spot on a dark background), or it is always off (a dark spot on a bright background). The first is the more visible of the two.
- A defective sub-pixel (dot defect) is less visible than a defective whole pixel and is small and only visible on a specific background.

The HP D5063 display does not have more than:

- 10 total dot defects.
- 10 defective full pixels.
- 10 defective red sub-pixels.
- 4 defective green sub-pixels (green is most visible).
- 10 defective blue sub-pixels.
- No more than two adjacent (less than 2.5 mm edge-to-edge) and defective pixels.
- No more than two pairs of two adjacent defective pixels.

To locate defective pixels, the monitor should be viewed under normal operating conditions, in normal operating mode at a supported resolution and refresh rate, from a distance of approximately 50 cm (16 in.).

HP expects that, over time, the industry will continue to improve its ability to produce LCDs with fewer cosmetic imperfections and HP will adjust guidelines as improvements are made.

LCD Monitor Quality and Pixel Policy for f70 Monitor

f70 17-inch monitor

The HP f70 TFT monitor uses high-precision technology, manufactured according to HP standards, to guarantee trouble-free performance. Nevertheless, the display may have cosmetic imperfections that appear as small bright or dark spots. This is common to all LCD displays used in products supplied by all vendors and is not specific to the HP D5064 displays. These imperfections are caused by one or more defective pixels or sub-pixels.

- A pixel consists of one red, one green, and one blue sub-pixel.
- A defective whole pixel is always on (a bright spot on a dark background), or it is always off (a dark spot on a bright background). The first is the more visible of the two.
- A defective sub-pixel (dot defect) is less visible than a defective whole pixel and is small and only visible on a specific background.

The HP D5064 display does not have more than:

- 15 total dot defects.
- 10 defective full pixels.
- 10 defective red sub-pixels.
- 4 defective green sub-pixels (green is most visible).
- 10 defective blue sub-pixels.
- No more than two adjacent (less than 2.5 mm edge-to-edge) and defective pixels.
- No more than two pairs of two adjacent defective pixels.

To locate defective pixels, the monitor should be viewed under normal operating conditions and in normal operating mode at a supported resolution and refresh rate, from a distance of approximately 50 cm (16 in.).

HP expects that, over time, the industry will continue to improve its ability to produce displays with fewer cosmetic imperfections and HP will adjust guidelines as improvements are made.

Technical Specifications for the f50 Monitor

f50 15-inch monitor

Liquid Crystal Display (LCD)	Display Size	15-in. (38 cm) diagonal and viewable image
	Type	TFT liquid crystal display
Input Signal	Video	0.7 V (0,7 V) p-p analog RGB
	Synchronization	Separated H/V (TTL level)
Interface	Input Connector	Analog R, G, B separate H,V sync. 15-pin mini D-SUB + Digital DVI-D
Scanning Frequency	Horizontal	30–60 kHz
	Vertical	56–75 Hz
Max. Resolution (H x V)	1024 x 768 @ 75 Hz	
Recommended Resolution (H x V)	1024 x 768 @ 60 Hz	
Power Source	AC/DC Adapter	Input Rating: 100–240 V~, 2 A max Output Rating: 12 V ⎓, 4.16 A (4,16 A) Frequency: 50/60 Hz Power Consumption: less than 36 W in operating mode
Operating Environment	Temperature	5° C to 40° C
	Humidity	20% RH through 85% RH (without condensation)
Storage Environment	Temperature	–20° C to 60° C
	Humidity	8% RH through 85% RH (without condensation)
Dimensions	H x W x D With stand: 400 x 365 x 215 mm (15.7 x 14.4 x 8.5 in)	
Weight	With stand: 4.8 Kg (10.6 lbs)	
Tilt Stand	Tilt Angle: Down 5, up 25 degrees	

Technical Specifications for the f70 Monitor

f70 17-inch monitor

Liquid Crystal Display (LCD)	Display Size	17-in. (43 cm) diagonal and viewable image
	Type	TFT liquid crystal display
Input Signal	Video	0.7 Vp-p analog RGB
	Synchronization	Separated H/V (TTL level)
Interface	Input Connector	15-pin D-SUB (Analog) DVI-D (Digital)
Scanning Frequency	Horizontal	30–80 kHz
	Vertical	56–75 Hz
Max. Resolution (H x V)	1280 x 1024 @ 75 Hz	
Recommended Resolution (H x V)	1280 x 1024 @ 60 Hz	
Power Source	AC/DC Adapter	Input Rating: 100–240 V~, 2 A max Output Rating: 12 V ⎓, 4.16 A (4,16 A) Frequency: 50/60 Hz Power Consumption: less than 75 W in operating mode
Operating Environment	Temperature	10° C to 35° C
	Humidity	20% RH through 80% RH (without condensation)
Storage Environment	Temperature	–10° C to 60° C
	Humidity	8% RH through 85% RH (without condensation)
Dimensions	H x W x D With standard stand: 468 x 419 x 206 mm 18.4 x 16.5 x 8.1 in.	
Weight	With standard stand: 6.1 Kg (13.42 lbs)	
Tilt Stand	Tilt Angle: Down 5, up 25 degrees	
Security Lock	Monitor cabinet is provided with a slot allowing the use of Kensington lock device	

HP f70 Audio System Performance Specifications

Amplifier Performance	Output power per channel into 8 ohm loads, both channels driven, 1 kHz, with 12 V ⎓ regulated supply:	> 3 W @ <5% THD
	Signal-to-Noise ratio, grounded inputs, maximum gain, A-weighted, referred to full output:	> 85dB
	Crosstalk, 22 kHz bandwidth, 1 kHz, shorted inputs, at maximum gain:	better than –50dB
	Nominal THD below 2 W, 1 kHz, 30 kHz measurement bandwidth:	< 0.1% (0,1%)
	Sensitivity (input voltage to produce full output):	–400 mV rms @ 1 kHz
	Input impedance:	10k
Storage Performance	Frequency response:	150 Hz—23 kHz, –3 dB @ 230 Hz and 22 kHz
	Maximum SPL:	@ 0.5 m (0,5 m): 99 dB C-weighted (calculated)
	Idle current draw:	40 mA

NOTE: *The purpose of this document is to specify the nominal electrical and acoustical performance of the audio system for the HP Pavilion f70 flat panel LCD computer display.*

Care and Cleaning

To maximize the screen lifespan of this product and to prevent damage to the liquid crystal display, it is recommended that you:

- Do not let liquid get on or into the monitor.
- Do not store or use the monitor in locations exposed to heat, direct sunlight, or extreme cold.
- Do not store or use the monitor in a dusty environment or in locations exposed to high humidity.
- Do not press sharp or pointed objects against the monitor.
- Avoid touching or pressing the screen of the monitor.
- Avoid setting contrast and brightness to their maximum levels for prolonged periods.
- Turn off the monitor when not in use.
- Do not place anything on or against the audio base (f70 17-inch monitor only).
- Use a soft brush or cloth to clean the audio base (f70 17-inch monitor only).
- Clean the screen with isopropyl alcohol or ethyl alcohol diluted with water (1:1) to prevent damage to the screen's anti-glare coating.

To clean the screen:

1 Turn off the monitor and remove the power plug (pull the plug, not the cable).

2 Soak a soft gauze cloth with isopropyl alcohol or ethyl alcohol diluted with water (1:1) and gently wipe the surface of the monitor. Do not dust it or wipe it with a cloth dampened with pure water.

3 Dry with a clean, soft cotton cloth.

CAUTION: **Never use pure water to clean the LCD screen. Do not use cleaning solutions containing fluoride, acids, or alkalis. Do not use ketone substances such as acetone or solvents such as xylene or toluene to clean the monitor. Do not use benzene, thinner, ammonia, or any volatile substance to clean the monitor's screen or cabinet. These chemicals may damage the monitor.**

Environmental Information

HP has a strong commitment to the environment. The HP monitor has been designed with respect for the environment as much as possible.

HP can also take back your old monitor for recycling when it reaches the end of its useful life.

HP has a product take-back program in several countries. The collected equipment is sent to one of HP's recycling facilities in Europe or the USA. As many parts as possible are reused. The remainder is recycled. Special care is taken with batteries and other potentially toxic substances; these are reduced to harmless components through a special chemical process. If you require more details about HP's product take-back program, contact your dealer or your nearest HP sales office.

Regulatory Information

DECLARATION OF CONFORMITY

According to ISO/IEC Guide 22 and CEN/CENELEC EN 45014

Manufacturer's name: HEWLETT-PACKARD France
Manufacturer's address: 5 Avenue Raymond Chanas-Eybens
38053 GRENOBLE Cedex 09 - FRANCE

Declares that the products :

Product Name	HP 15" (LCD) Color Monitor	HP 17" (LCD) Color Monitor
Model Number	**D5063****	**D5064****

(* can be any alphanumerical character)

Conform to the following Product Specifications :

§ SAFETY - International: IEC 60950:1991 +A1 +A2 +A3 +A4 / GB4943-1995.
- Europe : EN 60950:1992 +A1 +A2 +A3 +A4 +A11.

§ ELECTRO-MAGNETIC COMPATIBILITY
- CISPR22:1997 / EN55022:1998 Class B
- CISPR24:1997 / EN55024:1998
- IEC 61000-3-3:1994 / EN61000-3-3:1995
- GB9254-1998
- FCC Title 47 CFR, Part 15 Class B [1)]
- ICES-003, Issue 3
- VCCI-B
- AS/NZ 3548:1995

Products bearing the CE marking[(2)] also comply with:

- IEC 61000-3-2:1995 / EN 61000-3-2:1995. + A14

Those products comply with the requirements of the following Directives and carry the CE marking accordingly: EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC, both amended by the Directive 93/68/EEC.

[1)] This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

[2)] All products sold in the European Economic Area (EEA) bear the CE marking.

Grenoble
July 2001

Didier CABARET
Quality Manager

For Compliance Information ONLY, contact :
USA contact : Hewlett Packard Company, Corporate Product Regulations Manager 3000 Hanover Street, Palo Alto, CA 94304. (Phone (+1) (650) 857-1501)

For Compliance Information ONLY, contact:

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Corporate Product Regulations Manager
3000 Hanover Street
Palo Alto, CA 94304
Phone : (+1) (650) 857-1501

Notice for the USA: FCC Class B Statement

Federal Communications Commission Radio Frequency Interference Statement Warning:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, that can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to an outlet on a different circuit to the one the receiver is connected to.
- Consult your dealer or an experienced radio/TV technician for help.

Safety Warning for USA

If the power cord is not supplied with the monitor, select the proper power cord according to your national electric specifications.

- USA: use a UL listed type SVT detachable power cord.

Notice for Canada

This Class "B" digital apparatus complies with all requirements of the Canadian Interference-Causing Equipment Regulations (ICES.003).

Cet appareil numérique de la Classe B est conforme a la norme MB-003 du Canada.

MPRII Statement

The monitor complies with MPRII guidelines for upper limits of electrostatic and magnetic field emissions, from the Swedish National Board of Measurement and Testing.

Notice for Korea

사용자 안내문 (B급기기)
이 기기는 비업무용으로 전자파장해 검정을 받은 기기로서, 주거지역에서는물론 모든 지역에서 사용할 수 있습니다.

Notice for Germany

Hinweis für Deutschland: Geräuschemission

Lärmangabe nach Maschinenlärmverordnung — 3 GSGV (Deutschland)

LpA < 70db am Arbeitsplatz normaler Betrieb nach EN27779: 11.92

Notice for Japan (Class B)

この装置は，情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は，家庭環境で使用することを目的としていますが，この装置がラジオやテレビジョン受信機に近接して使用されると，受信障害を引き起こすことがあります。
取り扱い説明書に従って正しい取り扱いをして下さい。

TCO '99 (European Union Only)

Congratulations! You have just purchased a TCO '99 approved and labeled product! Your choice has provided you with a product developed for professional use. Your purchase has also contributed to reducing the burden on the environment and to the further development of environmentally adapted electronics products.

This product meets the requirements for the TCO '99 scheme which provides for an international environmental and quality labeling of personal computers. The labeling scheme was developed as a joint effort by the TCO (The Swedish Confederation of Professional Employees), Svenska Naturskyddsforeningen (The Swedish Society for Nature Conservation), Statens Energimyndighet (The Swedish National Energy Administration), and SEMKO AB.

The requirements cover a wide range of issues: environmental, ergonomic, usability, reduction of electric and magnetic fields, energy consumption and electrical safety.

Why do we have environmentally labeled computers?

In many countries, environmental labeling has become an established method for encouraging the adaptation of goods and services to the environment. The main problem, as far as computers and other electronics equipment are concerned, is that environmentally harmful substances are used both in the products and during their manufacture. Since it is not so far possible to satisfactorily recycle the majority of electronics equipment, most of these potentially damaging substances sooner or later enter nature.

There are also other characteristics of a computer, such as energy consumption levels, that are important from the viewpoints of both the work (internal) and natural (external) environments. Since all methods of electricity generation have a negative effect on the environment (for example, acidic and climate-influencing emissions, radioactive waste), it is vital to save energy. Electronics equipment in offices is often left running continuously and thereby consumes a lot of energy.

What does the environmental labeling involve?

The environmental demands have been developed by Svenska Naturskyddsforeningen (The Swedish Society for Nature Conservation). These demands impose restrictions on the presence and use of heavy metals, brominated and chlorinated flame retardants, CFCs (freons) and chlorinated solvents, among other things. The product must be prepared for recycling, and the manufacturer is obliged to have an environmental policy which must be adhered to in each country where the company implements its operational policy.

The energy requirements include a demand that the computer and/or monitor, after a certain period of inactivity, shall reduce its power consumption to a lower level in one or more stages. The length of time to reactivate the computer shall be reasonable for the user.

Below, you will find a brief summary of the environmental requirements met by this product. The complete environmental criteria document may be ordered from:

TCO Development
SE-114 94 Stockholm, Sweden

Fax: +46 8 782 92 07

Email (Internet): development@tco.se

Current information regarding TCO '99 approved and labeled products may also be obtained over the Internet, using the address: http://www.tco-info.com/

Environmental requirements

Flame retardants:

Flame retardants are present in printed circuit boards, cables, wires, casings and housings. Their purpose is to prevent, or at least to delay, the spread of fire. Up to 30% of the plastic in a computer casing can consist of flame retardant substances. Most flame retardants contain bromine or chloride, and those flame retardants are chemically related to another group of environmental toxins, PCBs. Both the flame retardants containing bromine or chloride and the PCBs are suspected of giving rise to severe health effects, including reproductive damage in fish-eating birds and mammals, due to the bio-accumulative*[1] processes. Flame retardants have been found in human blood and researchers fear that disturbances in foetus development may occur.

The relevant TCO '99 demand requires that plastic components weighing more than 25 grams must not contain flame retardants with organically bound bromine or chlorine. Flame retardants are allowed in the printed circuit boards since no substitutes are available.

Cadmium:[2]*

Cadmium is present in rechargeable batteries and in the colour-generating layers of certain computer displays. Cadmium damages the nervous system and is toxic in high doses. The relevant TCO '99 requirement states that batteries, the colour-generating layers of display screens and the electrical or electronics components must not contain any cadmium.

Mercury:[2]*

Mercury is sometimes found in batteries, relays and switches. It damages the nervous system and is toxic in high doses. The relevant TCO '99 requirement states that batteries may not contain any mercury. It also demands that mercury is not present in any of the electrical or electronics components associated with the labeled unit. There is however one exception. Mercury is, for the time being, permitted in the back light system of flat panel monitors as there today is no commercially available alternative. TCO aims on removing this exception when a mercury free alternative is available.

CFCs (freons):

The relevant TCO '99 requirement states that neither CFCs nor HCFCs may be used during the manufacture and assembly of the product. CFCs (freons) are sometimes used for washing printed circuit boards. CFCs break down ozone and thereby damage the ozone layer in the stratosphere, causing increased reception on earth of ultraviolet light with e.g. increased risks of skin cancer (malignant melanoma) as a consequence.

*Lead:*2**

Lead can be found in picture tubes, display screens, solders and capacitors. Lead damages the nervous system and in higher doses, causes lead poisoning. The relevant TCO '99 requirement permits the inclusion of lead since no replacement has yet been developed.

**1 Bio-accumulative is defined as substances which accumulate within living organisms.*

**2* Lead, Cadmium and Mercury are heavy metals which are Bio-accumulative.*

Quidway® S3300 Switches

HUAWEI TECHNOLOGIES CO., LTD.

HUAWEI

Product Brochure

Quidway® S3300 Switches

Product Overview

Quidway® S3300 switches (S3300 for short) are next-generation Layer-3 100-megabit Ethernet switches developed by Huawei to carry various services on Ethernets, which provide powerful Ethernet functions for carriers and enterprise customers. Utilizing next-generation high-performance hardware and Huawei Versatile Routing Platform (VRP) software, the S3300 supports enhanced selective QinQ, line-speed cross-VLAN multicast duplication, and Ethernet OAM. It also supports carrier-class reliability networking technologies including Smart Link (applicable to tree networks) and RRPP (applicable to ring networks). The S3300 can be used as an access device in a building or a convergence and access device on a campus network. The S3300 supports easy installation, automatic configuration, and plug-and-play, which dramatically reduces the network deployment cost of customers.

The S3300 is a case-shaped device with a 1 U high chassis, provided in a standard version (SI), an enhanced version (EI), and an advanced version (HI). SI supports Layer-2 functions and basic Layer-3 functions. EI supports complex routing protocols and abundant features. HI supports higher-specification MAC addresses, routes, and multicast table entries, and more powerful hardware capabilities.

Product Appearance

S3326C-HI

- Provides twenty-two 10/100Base-TX ports and two gigabit Combo ports (10/100/1000Base-T or 100/1000Base-X); a two-port gigabit optical-port card can be selected as the uplink interface card.
- Supports dual pluggable power supplies, AC power supplies, and DC power supplies.

S3328TP-EI-MC

- Provides twenty-four 10/100Base-TX ports, two 1000Base-X SFP ports, and two gigabit Combo ports (10/100/1000Base-T or 100/1000Base-X).
- Supports AC power supplies.

S3328TP-SI/EI

- Provides twenty-four 10/100Base-TX ports, two 1000Base-X SFP ports, and two gigabit Combo ports (10/100/1000Base-T or 100/1000Base-X).
- Two models: one supports AC power supplies and the other supports DC power supplies.

3328TP-PWR-EI

- Provides twenty-four 10/100Base-TX ports, two 1000Base-X SFP ports, and two gigabit Combo ports (10/100/1000Base-T or 100/1000Base-X).
- Supports dual pluggable power supplies, AC power supplies, and PoE supplies.

S3328TP-EI-24S

- Provides twenty-four 100Base-FX SFP ports, two 1000Base-X SFP ports, and two gigabit Combo ports (10/100/1000Base-T or 100/1000Base-X).
- Two models: one supports AC power supplies and the other supports DC power supplies.

S3352P-SI/EI

- Provides forty-eight 10/100Base-TX ports, two 100/1000Base-X SFP ports, and two 1000Base-X SFP ports.
- Two models: one supports AC power supplies and the other supports DC power supplies.

S3352P-PWR-EI

- Provides forty-eight 10/100Base-TX ports, two 100/1000Base-X SFP ports, and two 1000Base-X SFP ports.
- Supports dual pluggable power supplies, AC power supplies, and PoE supplies.

S3352P-EI-24S

- Provides twenty-four 10/100Base-TX ports, twenty-four 100Base-FX SFP ports, two 100/1000Base-X SFP ports, and two 1000Base-X SFP ports.
- Two models: one supports AC power supplies and the other supports DC power supplies.

3352P-EI-48S

- Provides forty-eight 100Base-FX SFP ports, two 100/1000Base-X SFP ports, and two 1000Base-X SFP ports.
- Two models: one supports AC power supplies and the other supports DC power supplies.

Product Features

Powerful Surge Protection

- The S3300 adopts the Huawei patented built-in surge protection technology that can effectively defend against lightning induced over-voltage. Each port has a surge protection capability of 6 KV. Compared with the conventional surge protection design, the Huawei patented surge protection technology greatly reduces the possibility of lightning damage on the device in severe environments or even in scenarios where grounding cannot be implemented.

Unique Fan-Free Design

- In the S3300 series, three non-PoE models that have 24 electrical ports adopt a fan-free design, which dramatically reduces the power consumption and noise of the device. In addition, this design reduces mechanical faults and protects the device against damages caused by condensed water and dust.
- The S3300 adopts next-generation highly-integrated chips and power-saving circuit design to ensure even heat dissipation. It also supports idle port sleep to further reduce power consumption.
- The S3300 emits low radiation and complies with the radiation standards of electric appliances, so it has no harm to human body and is more environmentally friendly.

Powerful Service Support

- The S3300 supports enhanced selective QinQ by using chips. This function adds outer VLAN tags to packets without occupying ACL resources to support multi-service provisioning.
- The S3300 supports 1,024 multicast groups (the 33HI supports 2,048 multicast groups) and protocols including IGMP snooping, IGMP filter, IGMP fast leave, and IGMP proxy. The S3300 supports line-speed cross-VLAN multicast replication, multicast load balancing among bundled ports, and controllable multicast, meeting requirements for IPTV and other multicast services.
- The S3300 supports Multi-VPN-Instance CE (MCE) to isolate users of different VPNs on a device, ensuring user data security and reducing customer expenditures.
- Multiple models of the S3300 support PoE and comply with IEEE 802.3af and 802.3at (PoE+). By using this function, the S3300 can supply power over the Ethernet to the connected standard PDs such as IP Phones, WLAN APs, and Bluetooth APs. Each port can provide up to 30 W of power. This reduces the power cable layout and management cost for terminal devices. The S3300 can also be configured to provide power for PDs at specified time as required.

Security and QoS

- The S3300 provides various security protection measures. It can defend against Denial of Service (DoS) attacks, attacks to networks, and attacks to users. DoS attacks include SYN Flood attacks, Land attacks, Smurf attacks, and ICMP Flood attacks. Attacks to networks refer to STP BPDU/root attacks. Attacks to users include bogus DHCP server attacks, man-in-the-middle attacks, IP/MAC spoofing attacks, DHCP request flood attacks, and DoS attacks by changing the CHADDR field of packets.

- The S3300 listens to the MAC/IP address, address lease, VLAN ID, and port number about a DHCP user by establishing and maintaining a DHCP snooping binding table. In this way, IP addresses and access ports of DHCP users can be tracked. The S3300 directly discards invalid packets that do not match binding entries, such as ARP spoofing packets and packets with bogus IP addresses, to prevent hackers or attackers from initiating man-in-the-middle attacks to campus networks by using ARP packets. The trusted port feature of DHCP snooping is used to ensure the validity of the DHCP server.
- The S3300 supports strict ARP learning to prevent ARP spoofing attackers from exhausting ARP entries so that authorized users can connect to the Internet. It also supports IP source check to prevent DoS attacks caused by MAC address spoofing, IP address spoofing, and MAC/IP address spoofing. The URPF function provided by the S3300 can check packet transmission paths to authenticate the packets received, which can protect the network against the spread of source address spoofing attacks.
- The S3300 supports centralized MAC address authentication and 802.1x authentication. User information such as the user account, IP address, MAC address, VLAN ID, access port number, and flag indicating whether antivirus software is installed on the client can be bound statically or dynamically, and user policies (VLAN, QoS, and ACL) can be delivered dynamically.
- The S3300 can limit the number of source MAC addresses learned on a port to prevent attackers from exhausting MAC address entries by using bogus source MAC addresses. In this way, MAC addresses of authorized users can be learned and flooding is prevented.
- The S3300 can implement complex traffic classification based on information such as the five-tuple, IP priority, ToS, DSCP, IP protocol type, ICMP type, TCP source port number, VLAN ID, Ethernet frame protocol type, and CoS. The S3300 supports inbound and outbound ACLs. The S3300 supports flow-based two-rate three-color CAR. Each port supports eight priority queues, WRED congestion prevention mechanism, and multiple queue scheduling algorithms such as WRR, DRR, SP, WRR+SP, and DRR+SP. This ensures the quality of voice, video and data services.

Good Expandability and High Reliability

- The S3300 switches support Intelligent Stacking (iStack) and plug-and-play. Multiple S3300s start to construct a virtual switch automatically after being connected by stacking cables. Stacked switches are classified into active, standby, and slave switches. After a standby switch is configured, the duration of service interruption caused by faults on the active switch is reduced. The S3300 supports intelligent upgrade, freeing customers from upgrading the software version of a switch after adding the switch to a stack. Utilizing the iStack technology, multiple switches can be interconnected to expand the system capacity and can be managed by using a single IP address, which greatly reduces the cost of system expansion, operation, and maintenance. Compared with traditional networking technologies, iStack has advantages in expansibility, reliability, and system architecture.

- Besides the traditional STP, RSTP, and MSTP, the S3300 supports enhanced Ethernet reliability technologies such as Smart Link (applicable to tree networks) and RRPP (applicable to ring networks), which implements millisecond-level protective link switchover and ensures network reliability. In addition, the S3300 supports multi-instance for Smart Link and RRPP to implement load balancing among links, further improving bandwidth usage.
- The S33HI supports the Smart Ethernet Protection (SEP) protocol, a ring network protocol applied to the link layer of an Ethernet network. SEP is applicable to open ring networks and can be deployed independently from the upper-layer aggregation devices to provide millisecond-level switchover without interrupting services. SEP features simplicity, high reliability, high switchover performance, convenient maintenance, and flexible topology, enabling customers to manage and deploy networks conveniently.

Considerate Maintenance-Free and Manageability

- The S3300 adopts a unique maintenance-free design and supports automatic configuration (auto-config), freeing network administrators from heavy configuration workload when deploying a batch of sites.
- The S3300 supports BFD and provides millisecond-level detection for protocols such as OSPF, IS-IS, VRRP, and PIM to improve network reliability. Complying with IEEE 802.3ah and 802.1ag, the S3300 supports point-to-point Ethernet fault management to detect faults on user links. Ethernet OAM improves the network management and maintenance capabilities on the Ethernet and ensures a stable network. The S33HI provides hardware-based OAM and BFD functions and supports 3.3-millisecond high-precision detection.
- The S3300 supports port-based and VLAN-based traffic statistics and NQA, which enables network administrators to better manage networks.
- The S3300 supports the GARP Registration Protocol (GVRP). The GVRP technology implements dynamic configuration of VLANs. In a complex networking environment, GVRP can simplify VLAN configuration and reduce network communication faults caused by incorrect configuration of VLANs. This reduces the manual configurations of network administrators and ensures correct VLAN configurations.

Various IPv6 Features

- The S3300 hardware supports both IPv4 and IPv6, IPv6 over IPv4 tunnels (including manual tunnels, 6-to-4 tunnels, and ISATAP tunnels), and Layer-3 line-speed forwarding. Therefore, the S3300 can be deployed on IPv4 networks, IPv6 networks, and networks that run IPv4 and IPv6 simultaneously. This makes the networking flexible and meets the requirements for the network transition from IPv4 to IPv6.
- The S3300 supports various IPv6 routing protocols including RIPng and OSPFv3. It uses the IPv6 Neighbor Discovery Protocol (NDP) to manage packets exchanged between neighboring nodes. The S3300 supports the Path MTU Discovery (PMTU) mechanism. That is, it selects a proper MTU on the path from the source to the destination to optimize network resource usage and obtain the maximum throughput.

Product Specifications

Item		S3300SI	S3300EI	S3300HI
Port	100-Mbit/s port	S3328TP-EI/S3328TP-SI/S3328TP-PWR-EI/S3328TP-EI-MC: twenty-four 10/100Base-T ports S3352P-EI/S3352P-SI/S3352P-PWR-EI: forty-eight 10/100Base-T ports S3328TP-EI-24S: twenty-four 100Base-FX ports S3352P-EI-24S: twenty-four 10/100Base-T ports and twenty-four 100Base-FX ports S3352P-EI-48S: forty-eight 100Base-FX ports S3326C-HI: twenty-two 10/100Base-T ports		
	1000-Mbit/s port	28-port device (SI/EI): two 1000Base-X ports and two 10/100/1000Base-T or 100/1000Base-X ports 52-port device (SI/EI): two 100/1000Base-X ports and two 1000Base-X ports S3326C-HI: two gigabit Combo ports (10/100/1000 BASE-T+100/1000 BASE-X)		
Forwarding performance		28-port device (SI/EI): 9.6 Mpps 52-port device (SI/EI): 13.2 Mpps		3326C-HI: 9.23 Mpps
Port switching capacity		28-port device (SI/EI): 12.8 Gbit/s 52-port device (SI/EI): 17.6 Gbit/s		S3326C-HI: 12.4 Gbit/s
Backplane switching capacity		64 Gbit/s		
MAC address table		Supports 16 K MAC address entries. Supports automatic learning and aging of MAC addresses. Supports static, dynamic, and blackhole MAC address entries. Supports packet filtering based on source MAC addresses.		Supports 32 K MAC address entries. Same as EI for the other items.
VLAN features		Supports up to 4,096 VLANs. Supports guest VLANs, voice VLANs, and super VLANs. Supports VLAN assignment based on MAC addresses, protocols, and IP subnets. Supports basic QinQ and selective QinQ. Supports 1:1 and N:1 VLAN switching.		
Reliability		Supports RRPP ring topology, intersecting rings, and multi-instance. Supports the Smart Link tree topology and Smart Link multi-instance to implement millisecond-level switchover between active and standby links. Supports STP, RSTP, and MSTP. Supports BPDU protection, root protection, and loopback protection. Supports SEP.		Supports Enhanced Trunk (E-Trunk). Same as EI for the other items.
		N/A	Supports BFD for OSPF, BFD for IS-IS, BFD for VRRP, and BFD for PIM.	Same as EI.
IPv4 routing		Supports static routing, RIP v1, RIP v2, and ECMP.		
		N/A	Supports OSPF, IS-IS, and BGP.	Same as EI.
IPv6 routing		Supports static routing and RIPng.	Supports static routing, RIPng, and OSPF v3.	Same as EI.

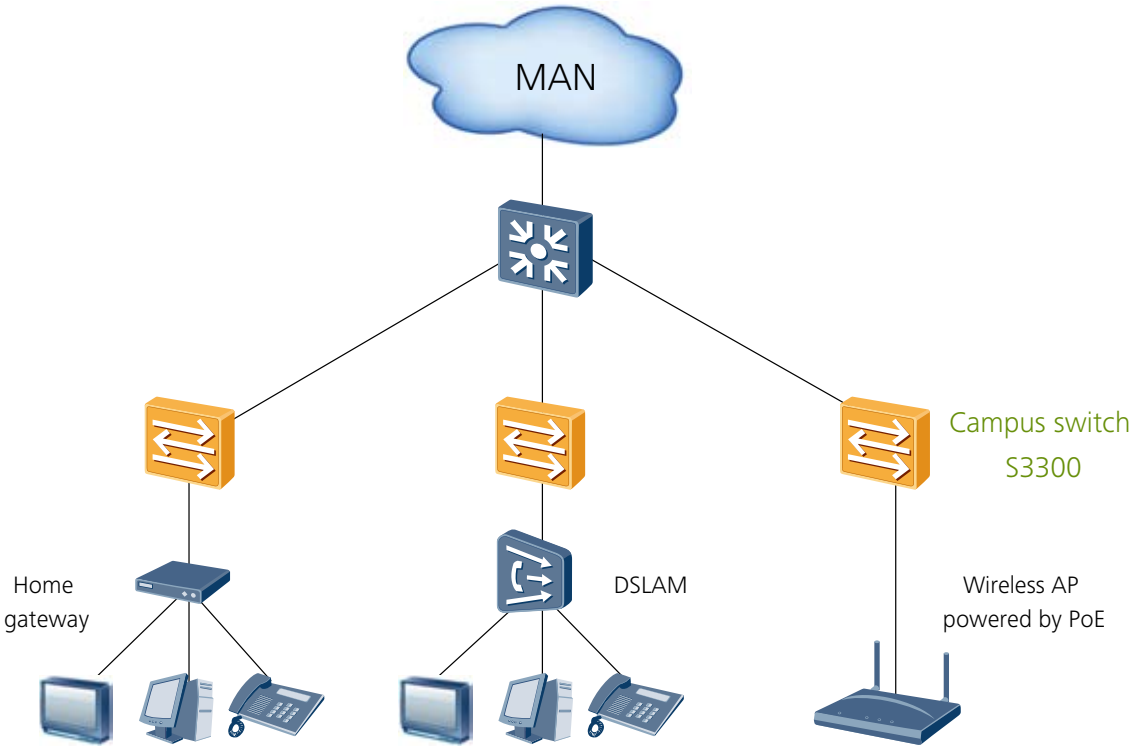
Item	S3300SI	S3300EI	S3300HI
IPv6 features	Supports Neighbor Discovery (ND). Supports PMTU. Supports IPv6 Ping, IPv6 Tracert, and IPv6 Telnet. Supports manually configured tunnels. Supports 6-to-4 tunnels. Supports ISATAP tunnels. Supports ACLs based on the source IPv6 address, destination IPv6 address, Layer-4 port, or protocol type. Supports MLD v1/v2 snooping.		
Multicast	Supports 1024 multicast groups. Supports IGMP v1/v2/v3 snooping and fast leave. Supports multicast VLAN and cross-VLAN multicast replication. Supports multicast load sharing among bundled ports. Supports controllable multicast. Supports port-based multicast traffic statistics.		Supports 2048 multicast groups. Same as EI for the other items.
	N/A	Supports IGMP v1/v2/v3, PIM-SM, and PIM-DM.	Same as EI.
QoS/ACL	Supports rate limit on packets sent and received by a port. Supports packet redirection. Supports port-based traffic policing and two-rate three-color CAR. Supports eight queues on each port. Supports multiple queue scheduling algorithms including WRR, DRR, SP, WRR+SP, and DRR+SP. Supports WRED (the S3300HI only) Supports re-marking of the 802.1p priority and DSCP priority. Supports packet filtering based on Layer 2 to Layer 4 information, filtering out invalid frames based on the source MAC address, destination MAC address, source IP address, destination IP address, port number, protocol, and VLAN ID. Supports queue-based rate limit and traffic shaping on ports.		
Security	Supports hierarchical user management and password protection. Supports DoS attack defense, ARP attack defense, and ICMP attack defense. Supports binding of the IP address, MAC address, port number, and VLAN ID. Supports port isolation, port security, and sticky MAC. Supports blackhole MAC addresses. Supports limit on the number of MAC addresses to be learned. Supports IEEE 802.1X authentication and the limit on the maximum number of users on a port. Supports multiple authentication methods including AAA, RADIUS, HWTACACS+, and NAC. Supports SSH v2. Supports CPU protection. Supports blacklisting and whitelisting.		
Surge protection	Each port has a surge protection capability of 6 KV. Each port has a surge protection capability of 15 KV after an extra surge protection device is added.		

Item	S3300SI	S3300EI	S3300HI
Management and maintenance	Supports iStack (except the S33HI). Supports MAC Forced Forwarding (MFF). Supports auto-config and HGMP. Supports remote configuration and maintenance by using Telnet. Supports Virtual Cable Test (VCT). Supports Ethernet OAM (IEEE 802.3ah and 802.1ag). Supports Dying gasp power-off alarm (the S3328TP-EI-MC and the S3326C-HI only). Supports local port mirroring, Remote Switched Port Analyzer (RSPAN), and packet forwarding on an observing port. Supports SNMP v1/v2/v3 and RMON. Supports MUX VLAN and GVRP. Supports the Network Management System (NMS) and Web management. Supports SSH v2. Supports HTTPS (the S3300HI only). Supports 802.3az EEE (the S3300HI only). Supports system logs and multi-level alarms.		
Operating environment	Operating temperature: 0° C to 50° C (long term); –5° C to 55° C (short term); relative humidity: 10% to 90% (non-condensing)		
Power supply	AC: Rated voltage: 100 V to 240 V, 50/60 Hz Maximum voltage: 90 V to 264 V, 50/60 Hz DC: Rated voltage: –48 V to –60 V Maximum voltage: –36 V to –72 V Note: Models supporting PoE do not use DC power supplies.		
Dimensions: width x depth x height	S3328TP-EI/SI, S3328TP-EI-24S, S3352P-EI/SI, S3326C-HI, S3318P-EI-MC: 442 mm x 220 mm x 43.6 mm S3328TP-PWR-EI, S3352P-EI-48S, S3352P-EI-24S, S3352P-PWR-EI: 442 mm x 420 mm x 43.6 mm		
Weight	S3328TP-EI/SI/-MC < 2.5 kg S3328TP-EI-24S < 2.6 kg S3352P-EI/SI < 3 kg S3352P-EI-24S/48S < 4.8 kg S3328TP-PWR-EI < 4.03 kg (excluding power modules) S3352P-PWR-EI < 4.31 kg (excluding power modules) S3326C-HI < 3.3 kg (excluding power modules)		
Power consumption	S3328TP-EI/SI /-MC < 20 W S3328TP-EI-24S < 55 W S3352P-EI/SI < 38 W S3352P-EI-24S < 66 W S3352P-EI-48S < 92 W S3328TP-PWR-EI < 875 W, PoE power = 740 W S3352P-PWR-EI< 880 W, PoE power = 740 W S3326C-HI < 62 W		

Applications

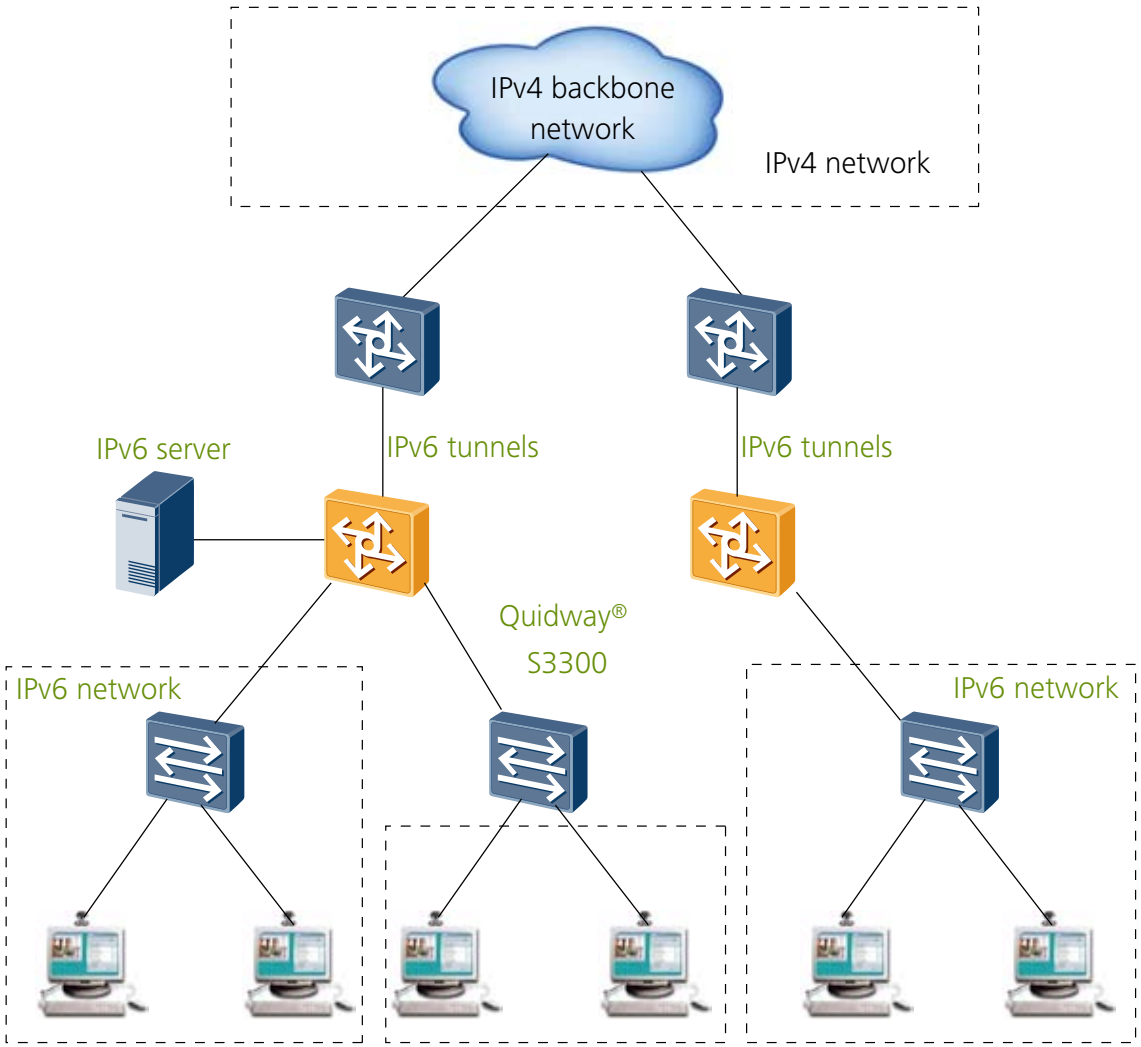
Serving as Access Devices in Buildings

The S3300 can connect to 100-Mbit/s DSLAMs as an aggregation switch in buildings. In this case, the selective QinQ function is configured on the S3300; outer VLAN tags identify the locations of the DSLAMs or campus, and the inner VLAN tags identify users. The S3300 can also connect to home gateways directly or supply power to PSEs such as wireless APs or IP phones through PoE. This enables the S3300 to better support multi-service deployment, unified planning, fine management, and convenient maintenance of customers.



Application of IPv4/IPv6

The S3300 supports both IPv4 and IPv6 and various tunnel protocols. In the initial phase of IPv6, IPv4 and IPv6 coexist on most networks. With the dual-protocol stack and rich tunnel protocols, the S3300 can be used to build networks flexibly and save costs on network migration.



Order Information

Product Description
S3326C-HI (supports two pluggable AC and DC power supplies, with the input voltage of 220 VAC or –48 VDC)
S3328TP-EI-MC (supports AC power supplies, with the input voltage of 220 V)
S3328TP-SI (supports AC and DC power supplies, with the input voltage of 220 VAC or –48 VDC)
S3328TP-EI (supports AC and DC power supplies, with the input voltage of 220 VAC or –48 VDC)
S3328TP-EI-24S (supports AC and DC power supplies, with the input voltage of 220 VAC or –48 VDC)
S3352P-SI (supports AC and DC power supplies, with the input voltage of 220 VAC or –48 VDC)
S3352P-EI (supports AC and DC power supplies, with the input voltage of 220 VAC or –48 VDC)
S3352P-EI-48S (supports AC and DC power supplies, with the input voltage of 220 VAC or –48 VDC)
S3352P-EI-24S (supports AC and DC power supplies, with the input voltage of 220 VAC or –48 VDC)
S3328TP-PWR-EI (supports two pluggable AC power supplies and PoE supplies, with the input voltage of 220 V)
S3352P-PWR-EI (supports two pluggable AC power supplies and PoE supplies, with the input voltage of 220 V)
Stacking cables
2-port GE optical-port card (the 33HI only)
AC power module (the S3300HI only)
DC power module (the S3300HI only)
250 W PoE power supply unit
500 W PoE power supply unit
GE-SFP Optical Module
Electrical module, SFP, GE, electrical port modules (100 m, RJ45)
Optical module, ESFP, GE, multimode modules (850 nm, 0.5 km, LC)
Optical module, SFP, GE, single-mode modules (1310 nm, 10 km, LC)
Optical module, eSFP, GE, single-mode modules (1310 nm, 40 km, LC)
Optical module, eSFP, GE, single-mode modules (1550 nm, 40 km, LC)
Optical module, eSFP, GE, single-mode modules (1550 nm, 80 km, LC)
Optical module, ESFP, GE, single-mode modules (1550 nm, 100 km, LC)
FE/STM-1-SFP Optical Module
Optical module, SFP, 100M/155M, single-mode modules (1310 nm, 2 km, LC)
Optical module, ESFP, 100M/155M, single-mode modules (1310 nm, 15 km, LC)
Optical module, eSFP, FE, single-mode modules (1310 nm, 40 km, LC)
Optical module, eSFP, FE, single-mode modules (1550 nm, 80 km, LC)

BIDI-SFP Optical Module
Optical module, SFP, GE, BIDI, single-mode modules (TX1490/RX1310, 10 km, LC)
Optical module, SFP, GE, BIDI, single-mode modules (TX1310/RX1490, 10 km, LC)
Optical module, SFP, FE, BIDI, single-mode modules (TX1310/RX1550, 15 km, LC)
Optical module, SFP, FE, BIDI, single-mode modules (TX1550/RX1310, 15 km, LC)
CWDM-SFP Optical Module
Optical transceiver, eSFP, 1571 nm, 100 Mbit/s to 2.67 Gbit/s, 0 dBm, 5 dBm, 28 dBm, LC, 80 km
Optical transceiver, eSFP, 1591 nm, 100 Mbit/s to 2.67 Gbit/s, 0 dBm, 5 dBm, 28 dBm, LC, 80 km
Optical transceiver, eSFP, 1551 nm, 100 Mbit/s to 2.67 Gbit/s, 0 dBm, 5 dBm, 28 dBm, LC, 80 km
Optical transceiver, eSFP, 1511 nm, 100 Mbit/s to 2.67 Gbit/s, 0 dBm, 5 dBm, 28 dBm, LC, 80 km
Optical transceiver, eSFP, 1611 nm, 100 Mbit/s to 2.67 Gbit/s, 0 dBm, 5 dBm, 28 dBm, LC, 80 km
Optical transceiver, eSFP, 1491 nm, 100 Mbit/s to 2.67 Gbit/s, 0 dBm, 5 dBm, 28 dBm, LC, 80 km
Optical transceiver, eSFP, 1531 nm, 100 Mbit/s to 2.67 Gbit/s, 0 dBm, 5 dBm, 28 dBm, LC, 80 km
Optical transceiver, eSFP, 1471 nm, 100 Mbit/s to 2.67 Gbit/s, 0 dBm, 5 dBm, 28 dBm, LC, 80 km

For more information, visit www.huawei.com or contact the local sales office of Huawei.

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SIEMENS

OTN
OPEN TRANSPORT NETWORK

OTN Management System (OMS)

FEATURES

Centralized or distributed network management

- Hardware management
- Connection management
- Alarm monitoring
- Event logging

User-friendly graphical user interface

Multiple OTN-150/600/2500/X3M rings can be managed simultaneously

Runs on a standard PC

Client-server architecture

Introduction

The OMS allows users to manage a single OTN ring, or a network consisting of several OTN rings.

Features

The OTN management software is designed to provide a user-friendly way of managing complete OTN networks (see Figure 1). Network management includes the configuration of hardware modules (hardware management), the creation of various services over the network (connection management), and the monitoring and logging of any defects that might occur in the network.

Hardware Management

The OMS can be used to configure the hardware modules that make up the network. Nodes, common logic cards, optical transceivers, interface cards and their submodules can be created and configured easily. Also the OTN Link Module (OLM) that is used to interconnect different OTN-150/600/2500 rings (subnetworks) can be managed via the OMS software. Once the network is operational, the OMS is used to monitor the correct operation of the hardware modules.

Connection Management

Via the OMS, the user can create services on the network or remove them from the network. Connections are made by defining the ports to be interconnected. The OMS itself allocates the transmission channels to point-to-point or multi point services in order to achieve an optimal bandwidth allocation. Figure 2 is an example of a point-to-point link between a PBX and its digital telephone set.

Database Management

The OMS contains a network database with all kinds of user information, such as subnetwork name, node names, node configurations (with the installed common logic cards and interface cards), services, alarms and fault indications.
This database can be used to restore the network configuration in case the settings in one or more nodes are lost due to a hardware defect.

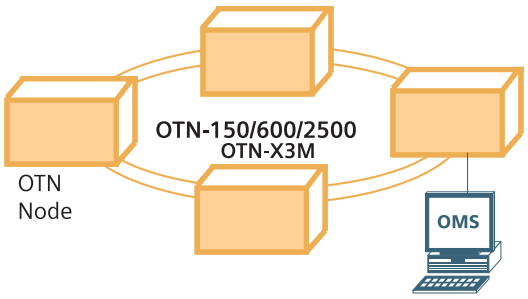

Figure 1: OMS Connected to the OTN Network

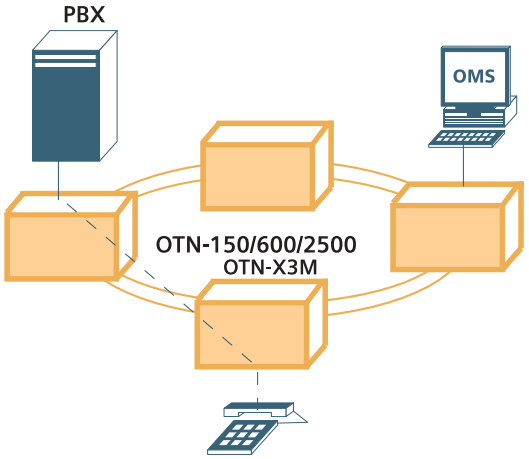

Figure 2: Service Connected over OTN

Graphical User Interface (GUI)
The network configuration is presented to the operator via a graphical user interface (GUI). The use of different colors makes it easy to locate faults in the network. By means of multiple views, different parts of the network can be monitored on the OMS screen simultaneously.
The OMS command structure is based on the use of menus, objects and the PC mouse. All commands can be activated by clicking with the PC mouse on the relevant field and entering the additional information via the keyboard.

Monitoring and Error Reporting
During normal operation, the OMS continuously polls all the OTN nodes in the network about status changes and compares the results with the actual information resident in its network database. If a fault or change occurs, the OMS will display an alarm message. The messages on the OMS screen indicate the nature and the location of possible errors, allowing rapid fault clearings.

Logging Network Events
The OMS registers a number of events, e.g. synchronization losses, network reconfiguration, node failure and interface card errors. It also provides extended reporting features. The events can be displayed on the OMS GUI and are stored in the OMS database.

Off-line Operation
The OMS allows the user to configure the network and the services without being connected to the network, either via the GUI or via scripting.
Once installed, the network can be activated by downloading the prepared network database to the OTN nodes.

When existing services are being replaced with new ones, the new services can first be configured off-line via the OMS, and then be established physically according to the updated data. In this way, the unavailability of a service is restricted to a minimum.

Extra Features Provided by OMS Add-on's

Additional (non-standard) functionality can be provided by means of OMS Add-on's.

Internal Alarm forwarding
Via an alarm relay module, the status of internal OTN network alarms can be sent to alarm devices such as acoustic or visual signals (e.g. bells, beepers or lamps). This alarm relay module can also be used to convey network alarms to a third-party higher-level alarm management system. Every internal alarm severity level (warning-minor-major-critical) corresponds with a contact on the alarm relay module that will be closed if an alarm with the corresponding severity occurs in the network.
Another way to forward OTN network alarms from the OMS to another alarm management platform is to use SNMP (Simple Network Management Protocol). The SNMP agent on OMS offers basic alarm forwarding and retrieval to an SNMP based management system.

Since the OMS uses CORBA (Common Object Request Broker Architecture) for its internal communication among processes and for its communication towards its clients, the OMS CORBA interface (the so-called IDL, Interface Description Language) can also be used to send OTN network alarms to third party equipment.

External Alarm Management
Via the RSXMM or RS232MM interface card, the status of alarm contacts external to the OTN network can be displayed on the OMS screen. At any contact input, the OMS user can define messages for both states of the external make-and-break contact. This message is displayed according to the contact status. The status of the external contacts can also be sent to contacts on an alarm relay module located at the OMS PC. In this way the status of external contacts can be sent to alarm devices such as acoustic or visual signals (e.g. bells, beepers or lamps).

Operation

Hardware and Software
The OMS runs on "low cost" hardware, i.e. a standard PC, and operates under Microsoft® Windows® NT v4.0, Windows® 2000 (OMS v2.4 and higher), and Windows® XP (OMS v3.0 and higher).

The OMS consists of a server software module and one or more client software modules. Both software modules (server and client) can run on the same OMS PC, or they can be distributed over multiple PCs (e.g. 1 server and 2 clients).

OMS Server
The OMS server module is connected to the OTN hardware and provides all communication with the hardware. It contains a database with the hardware and the services present in the network. It is also responsible for network alarm and event monitoring. The OMS server makes all this information available to the OMS client(s).

OMS Client
The OMS client module is the system's user interface (OMS GUI). It interacts with the OMS server and presents the network information in a user-friendly way to the network operator. It also allows the network operator to configure the hardware and the services present in the network. Multiple OMS clients can be active simultaneously. The OMS GUI is password protected

Single Client OMS Configuration
Figure 3 shows a client connected to an OMS server. Both software modules run on the same PC.

Multiple Client OMS Configuration
Multiple OMS clients can be connected to an OMS server (see Figure 4) allowing network management from multiple locations or by multiple users.

Remote Client OMS Configuration
A remote OMS client can be connected to the OMS Server via a TCP/IP connection over a modem link. In this way the remote OMS client can manage the OTN network from a remote location (see Figure 5).

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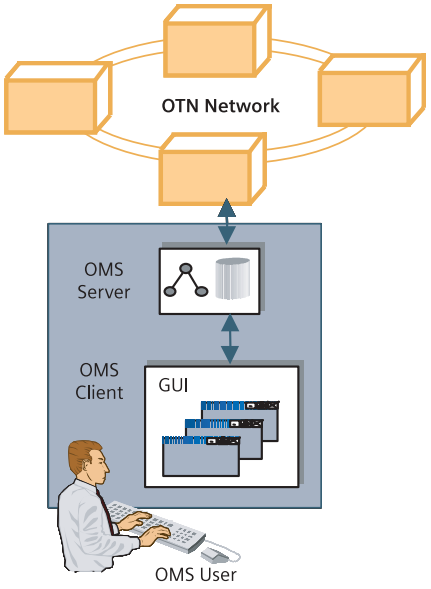

Figure 3 Single Client OMS Configuration

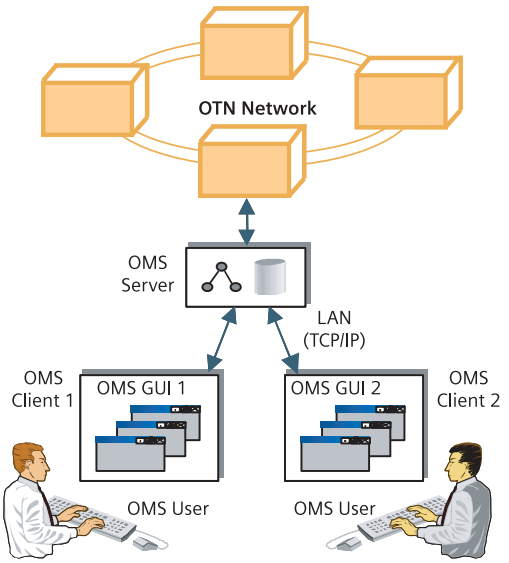

Figure 4 Multiple Client OMS Configuration

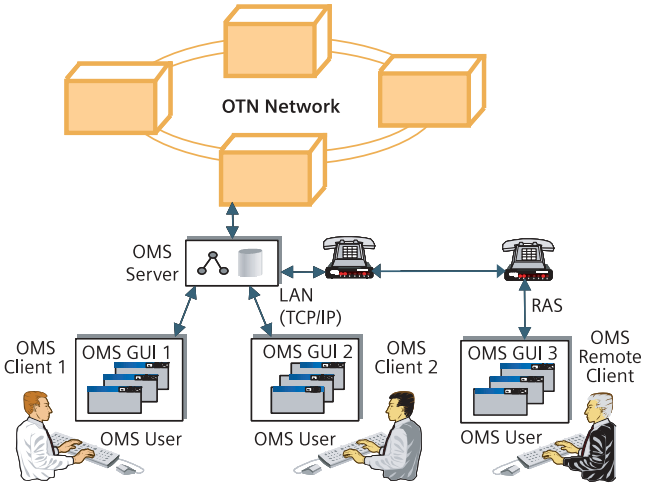

Figure 5 Remote Client OMS Configuration

OTN Management System (OMS)

Ref. No.: A31003-Z3931-S330-6-765
Issued November, 2003
Specifications subject to change as
design improvements are implemented

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OPEN TRANSPORT NETWORK (OTN)
OTN-X3M-N42C NODE

Introduction

The Open Transport Network (OTN) is a private communication system providing an extension over fiber for voice, data, LAN and video communications.
The system is based on “nodes” interconnected by two point-to-point fiber-optic links forming two counter-rotating rings. This topology, in combination with the system’s built-in fault recovery features, ensures extremely high system availability. This sheet describes the N42C node to be used for OTN-X3M.

Description

The OTN system is completely modular. The common equipment consists of the 19” mountable chassis with one or two system power supply modules (redundant) and one or two BORA-X3M/ETX/ULM common logic cards (redundant). Two hot-swap optical transceiver modules are plugged on each BORA-X3M/ETX/ULM common logic card. The N42C nodes have eight universal interface slots for interface modules in any mixture. Moreover, two extra slots are provided for extension cards.

The chassis is made of zinc-plated steel, offering excellent mechanical strength and fire resistance.

A Node Support Module (NSM) is part of the N42C node, but can be replaced if needed. It offers additional functionality (external alarm contacts, beeper, fan control and monitoring etc.) and is hot-swap replaceable.

The common logic card BORA-X3M/ETX/ULM is the node’s central control block. It holds the connections and configuration settings that are programmed by the network operator via the OTN Management System (OMS). In case two common logic cards are installed in one node, one of them functions as a hot standby card.

FEATURES

Very high system availablity and reliability

Wide choice of interfaces to match specific applications

Universal interface slots

Redundant common logic card

Redundant AC or DC power supply

Replaceable cooling shelf with 3 temperature controlled fans provides excellent cooling

Choice of hot-swappable optical transceivers to meet fiber and/or distance requirements

Extremely fast reconfiguration times in case of cable breaks or equipment failures

Hot swap:
all traffic-carrying elements can be replaced without shutting down the node

Bit Error Rate better than 10^{-9}

Standard 19” rack mountable

For OTN-X3M networks

OTN Systems
COMMITTED TO GET YOUR INFORMATION ACROSS

The Optical Transceivers convert the ring's optical signal to an equivalent electrical signal, and vice versa. The distance that can be spanned between two consecutive OTN nodes in the network depends on the type of fiber and the types of Optical Transceivers used.

The optical transceiver modules provide an OC-12C/48C /OC192C (Optical Carrier) connection in SONET mode or an optical STM-4C/16C/64C (Synchronous Transport Module) connection in SDH mode.

The OTN-X3M network can extend over a couple of hundred meters or up to thousands of kilometers. In this way, OTN-X3M offers a solution for mixed transmission over medium to large distances.

All available interface cards have been designed to operate on the physical level of the various communications standards. In this way all traffic for voice, data, LAN and video is handled completely transparent for the higher protocol levels.

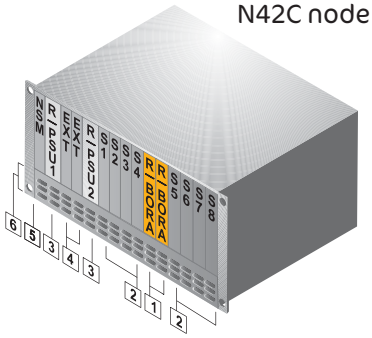
Operation

The N42C node can be used in OTN-X3M networks. It is compatible with N42 and N415 nodes, which can work at the same backbone speeds.

For detailed information about the common logic cards, please refer to the following specification sheets:

- BORA622-X3M, Ref. No. AD-S138-E-6
- BORA2500-X3M, Ref. No. AD-S153-E-3
- BORA2500-X3M-ETX, Ref. No. AD-S154-E-3
- BORA2500-X3M-ULM, Ref. No. AD-S139-E-5
- BORA10G-X3M-ETX, Ref. No. AD-S405-E-3

N42C node



① Common Logic Card(s):
BORA622-X3M,
BORA2500-X3M,
BORA2500-X3M-ETX or
BORA2500-X3M-ULM,
BORA10G-X3M-ETX
The BORA card has two hot-swap optical transceiver modules for OTN-X3M dual ring connection (single mode and multi-mode fiber optics available). Different modules for different distances are available.

② Interface slots
The 8 interface slots can accommodate any combination of interface cards. Max. 784 Mbps capacity per interface card, 100 % user bandwidth utilization.

③ 270 Watt System Power Supply Unit(s), 10 TE width
Supply voltage: 90 to 264 VAC (including 125 VDC) or 18 to 60 VDC, or any combination of both.

④ Extension cards
Two extra slots are provided for auxiliary cards

⑤ Node Support Module (is part of the N42C node)
Front accessible via 25-pin SUB-D connector 4 optically isolated digital IN, 4 optically isolated digital OUT (2 alarm relays, 2 general purpose), beeper, fan control & monitoring, node number, NSM self test button. Contains all active elements in node chassis, hot-swap replaceable

⑥ Fan tray containing 3 temperature controlled fans.
Tray can be replaced while the node is in operation

Ordering information

N42C node
S30826-B30-X
(For OTN-X3M)

Power Supply Units
90-264 VAC and 125 VDC V30812-A5020-A42
18-60 VDC V30812-A5020-A43

Specifications

Dimensions
This chassis is 19" rack mountable

Width	484 mm
Height (8 HU)	355 mm
Depth	317 mm

Power consumption
max. 400 W

Weight
Approx. 18 kg
(including 2 PSUs, and a BORA2500-X3M card)

Cooling
A fan tray at the bottom of the node contains 3 fans which cool the node when required. The fan speed is controlled based on the internal temperature in the node. Failure of a fan can be detected and the fan tray can be replaced while the node remains operational.

CE marking
EMC directive 2004/108/EC
LVD directive 2006/95/EC

MTBF (25°C / 77°F)
MTBF of the power supply module: 11 years

EMC tight, designed for 10GHz radiation

The node is made in vibration resistant (according to IEC 68-2-6) and fire resistant zinc-plated steel.

OTN Systems NV

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OPEN TRANSPORT NETWORK

OPEN TRANSPORT NETWORK (OTN)
OTN-X3M-N415 NODE

Introduction

The Open Transport Network (OTN) is a private communication system providing an extension over fiber for voice, data, LAN and video communications.
The system is based on “nodes” interconnected by two point-to-point fiber-optic links forming two counter-rotating rings. This topology, in combination with the system’s built-in fault recovery features, ensures extremely high system availability.
This sheet describes the N415 node to be used for OTN-X3M.

Description

The OTN system is completely modular. The common equipment consists of the 19” mountable chassis with one or two system power supply modules (redundant) and one BORA-X3M/ETX/ULM common logic card. Two hot-swap optical transceiver modules are plugged on the common logic card. The N415 nodes have four universal interface slots for interface modules in any mixture.

FEATURES

Very high system availability and reliability

Wide choice of interfaces to match specific applications

Universal interface slots

Redundant AC or DC power supply

Choice of hot-swappable optical transceivers to meet fiber and/or distance requirements

Extremely fast reconfiguration times in case of cable breaks or equipment failures

Hot-swap: all interface cards can be replaced without shutting down the node.

Bit Error Rate better than 10-9

Standard 19” rack mountable

For OTN-X3M networks

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A Node Support Module (NSM) is part of the N415 node, but can be replaced if needed. It offers additional functionality (external alarm contacts, beeper, fan control and monitoring etc.) and is integrated with the fan unit of the node.

The common logic card BORA-X3M/ETX/ULM is the node's central control block. It holds the connections and configuration settings that are programmed by the network operator via the OTN Management System (OMS).

The OTN-X3M network can extend over a couple of hundred meters or up to thousands of kilometers. In this way, OTN-X3M offers a solution for mixed transmission over medium to large distances.

All available interface cards have been designed to operate on the physical level of the various communications standards.

In this way all traffic for voice, data, LAN and video is handled completely transparent for the higher protocol levels.

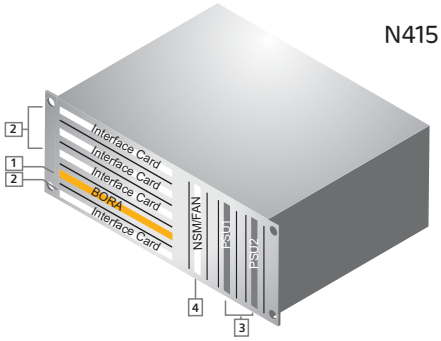
Operation

The N415 node can be used in OTN-X3M networks.

For detailed information about the transceivers and common logic cards, please refer to the following specification sheets:

- BORA2500-X3M, Ref. No. AD-S153-E-3
- BORA2500-X3M-ETX, Ref. No. AD-S154-E-3
- BORA622-X3M, Ref. No. AD-S138-E-6
- BORA2500-X3M-ULM, Ref. No. AD-S139-E-5
- BORA10G-X3M-ETX, Ref. No. AD-S405-E-3

N415 node



1| **Common Logic Card:**
BORA-X3M, BORA-X3M-ETX, BORA-X3M-ULM.
The common Logic card has two hot-swap optical transceiver modules (single mode and multi-mode fiber optics available). Different modules for different distances are available.

2| **Interface slots**
The 4 interface slots can accommodate any combination of interface cards.
Max. 784 Mbps capacity per interface slot, 100 % user bandwidth utilization.

3| **120 Watt System Power Supply Unit(s),** 10 TE width
Supply voltage: 90 to 264 VAC (including 125 VDC) or 18 to 60 VDC, or any combination of both.

4| **Node Support Module**
Front accessible via 25-pin SUB-D connector,
4 optically isolated digital IN, 4 optically isolated digital OUT (2 alarm relays, 2 general purpose), beeper, fan unit with dual fans, fan control & monitoring, node number, NSM self-test button.
Contains all active elements in node chassis.

Specifications

Dimensions
This chassis is 19" rack mountable

Width	482 mm
Height (3 HU)	133 mm
Depth	290 mm

Power consumption
max. 180 W

Weight
Approx. 9 kg (including 2 PSUs, and a BORA2500-X3M card)

Cooling
The node is equipped with a self-regulating fan unit with dual fans.

CE marking
EMC directive 2004/108/EC
LVD directive 2006/95/EC

MTBF (25°C / 77°F)
MTBF of the power supply module: 11 years

EMC tight, designed for 10GHz radiation

Ordering information

N415 node
S30826-B22-X (For OTN-X3M)

Power Supply Units
100-240 VAC and 125 VDC
V30812-A5020-A59(AC)
18-60 VDC
V30812-A5020-A60(DC)

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OPEN TRANSPORT NETWORK

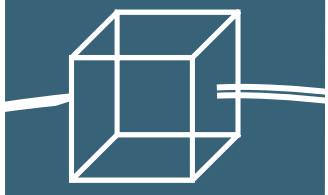
SIEMENS

OTN
OPEN TRANSPORT NETWORK

ET100E Fast Ethernet (10/100 Mbps) Interface Card

FEATURES

- Compliant with IEEE 802.3
  Flow control according to IEEE 802.3x
- Physical connection: 10/100BASE-T
- 6 Switched Ethernet ports
- Eliminates distance limitations of conventional Ethernet networks
- Independent Ethernet networks on a single OTN system
- Bandwidth through the OTN selectable from 1 Mbps up to 196 Mbps per Ethernet network
- Fully transparent for all higher layer protocols
- Self learning addresses, aging table
- Half / full duplex Ethernet operation (10/20, 100/200 Mbps)
- Auto negotiation (can be disabled via the management system)
- Extensive alarm and fault indicators
- VLAN transparent IEEE 802.1Q
- For OTN-150/600/2500 and OTN-X3M networks



Introduction

Thanks to its design, OTN can handle nearly all existing communication standards for voice, data, LAN and video. The Fast Ethernet interface card is only one of the many interfaces presently available for OTN. For more information, contact the address overleaf.

Description

The Fast Ethernet interface card is fully compliant with the IEEE 802.3 standard and allows to create fully transparent Ethernet networks through the OTN. Via the OTN management software, Fast Ethernet cards mounted in the OTN nodes are easily interconnected and are able to operate in half or full duplex Ethernet mode.
In OTN networks, the bandwidth through the OTN is selectable from 1 Mbps up to 196 Mbps via the OMS, depending of the OTN network type.

The card can be used in point-to-point and multipoint configurations. Point-to-point connections can be set up between two cards connected via OTN, implying both will be using the same bandwidth on the OTN ring. The complete transmission path can operate in full duplex mode.
In order to realize a multipoint configuration (network), ET100E cards in other nodes belonging to the same Ethernet subnetwork have also access to the OTN bandwidth. This way, a maximum of one 100 Mbps Ethernet card belonging to the same Ethernet subnetwork can be configured in each node of the OTN ring. One OTN node can be equipped with several ET100E cards, provided that each card belongs to a different Ethernet subnetwork. In an OTN-X3M node, the interface slots can be interconnected allowing multiple ET100E cards, belonging to the same Ethernet subnetwork, to be used in such OTN-X3M node.
Multipoint connections between ET100E cards installed in different OTN nodes of the same Ethernet subnetwork use the same bandwidth. The interface between the interface card and the connected device operates in half or full duplex mode.
The ET100E card offers a bandwidth of 100 Mbps or 10 Mbps (selectable via the OTN Management System (OMS) or via auto negotiation) to the connected devices. However, the bandwidth used through the OTN network is allocated by the OTN management system, and is selectable stepwise. This way, the OTN network allows to save bandwidth for 100 Mbps (resp. 10 Mbps) Ethernet networks which are not fully loaded.

The bandwidth setting applies to the entire Ethernet subnetwork, and can be changed via the OTN network management system at all times.
Consequently, the maximum number of 100 Mbps subnetworks which can be configured in an OTN network depends on their OTN bandwidth setting.
OTN allows to create Fast Ethernet networks covering more than one hundred kilometers without affecting network performance. This unique feature of OTN makes it very useful in stretched networks.

Operation

The ET100E card houses a sophisticated buffering mechanism guaranteeing maximum performance and transparency. The card itself acts as a 7 ports store and forward switch.
Each Fast Ethernet card on the OTN network has an address which is added to all packets coming from the connected equipment and which have to be forwarded to the OTN ring. The packets circulate on the OTN ring and are copied to all the ET100E cards being addressed. This means that only packets sent to the equipment located in other OTN nodes are transported on the OTN ring. Local traffic is blocked in the port switch.

ET100E Fast Ethernet (10/100 Mbps) Interface Card

When the addressed card receives its packets, it will remove them from the ring upon recognizing the address.

Applications

Parallel Networks
A number of LAN's may coexist in a single organization for several reasons. With multiple parallel LANs each department has the ability to grow and change its functions without affecting other departments' LANs. The use of standard Ethernet equipment such as fiber optic repeaters and switches makes the networks quite complicated and requires extra hardware and cabling. Using the OTN allows the different LANs to coexist in a single OTN network, which is not only a cost effective solution, but it also makes network management more easy.

Stretched Networks
Today, applications tend to shift from low speed data interfaces, e.g. V.24, to LAN interfaces. Some of these applications, e.g. ticket vending and SCADA (Supervisory Control And Data Acquisition) in a railway environment, cover a large geographical area. This problem is often solved by combining remote bridges and PCM type of equipment. However, this solution not only limits the performance significantly, it is also very expensive. OTN's Ethernet interface allows to span long distances without any loss in performance and in a native way and hence it is ideally suited for this type of application.

Factory Automation
Various types of interfaces are available to interconnect PLC (Programmable Logic Controller) equipment. Low speed PLCs are equipped with RS232 interfaces, whereas medium speed equipment uses the RS485-Fieldbus (see RS485 specification sheet), and high speed buses run on Ethernet. The fact that OTN is fiber based and very reliable and that it can span very long distances make it very useful in plant automation applications.

Ordering Information

Card
ET100E S30824-Q105-X101
The ET100E interface card can be installed in the N22 and N215 nodes for OTN-150/600/2500, and in the N42 node for OTN-X3M.

OMS Software Release
V2.2 and up (OTN-150/600/2500)
V4.0 and up (OTN-X3M)

Specifications

Compatibility
IEEE 802.3

Certification
FCC Part 15 CIA Pending
CE Marking
EMC directive 89/336/EEC
LVD directive 73/23/EEC

Circuits
6 Switched ET ports

Line Data Rate
10/100 Mbps (selectable via the OMS or through auto negotiation)

Bandwidth on OTN
OTN-150/600/2500 between 1 and 196 Mbps, selectable stepwise via the OMS and depending of the OTN network type.

Connectors
RJ45 jack connectors (10/100BASE-T)

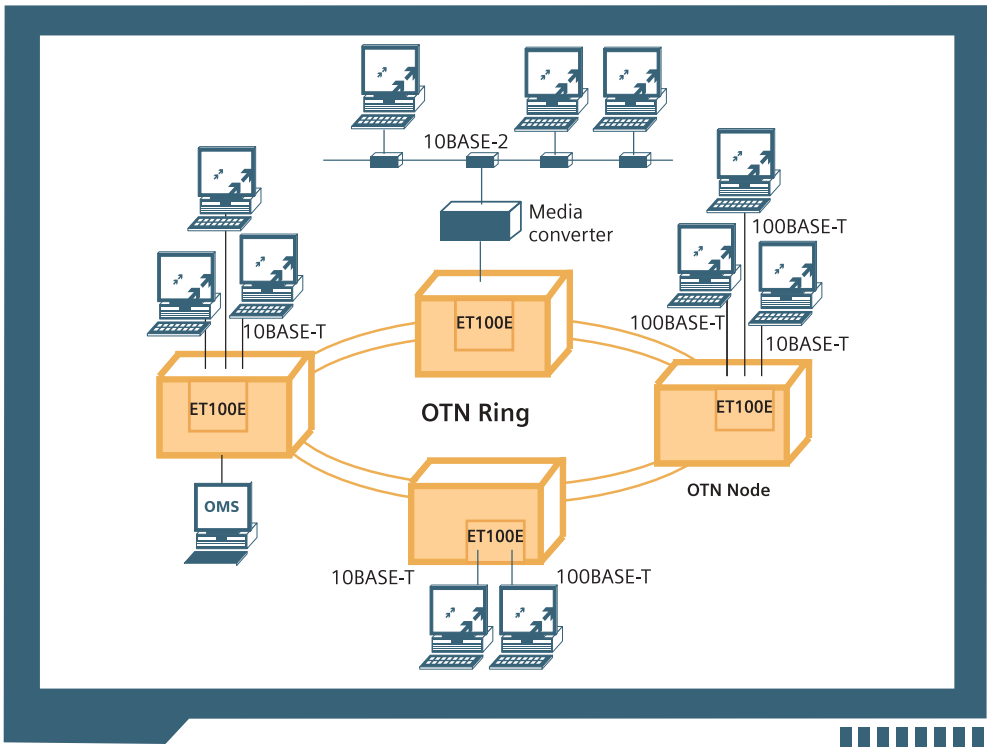
Status & Control Information
Card active/inactive
Card type
Monitor selection
Monitor active
Data in input buffer
Data in output buffer
Excessive collisions
Packet too long
Buffer status
Packet removed
Input buffer overflow

On Board Indications
Link (up/down)
Activity (receive/transmit)
100 (10/100 Mbps)
FDX (HDX/FDX)

Card Size
Double Eurocard 200 x 233.4 mm

Weight
Approx. 495 g

Reliability (MTBF)
at 25°C (77°F)
20 years (= 5708 FITS)



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OPEN TRANSPORT NETWORK (OTN)
RSXMM (MULTICHANNEL - MULTIDROP) INTERFACE CARD

Introduction

The concept of the OTN enables it to handle nearly all existing communication standards for voice, data, LAN and video. The RSXMM (Multichannel - Multidrop) card is only one of the many interfaces presently available. For more information, please contact the address overleaf.

Description

The RSXMM card supports RS232 and RS422 applications, depending of the connector used on the front panel. It allows to program 12 point-to-point connections or to create up to 6 separate RS232 or RS422 multidrop circuits or a combination of both.

FEATURES

- Point-to-point connections and multidrop networks
- 12 circuits per card for RS232 or RS422, depending of the front panel connector used
- 4 RTS/CTS ports per card
- Asynchronous and synchronous data transmission
- Transmission speed RS232 programmable per port from 4.8 through 100 kbit/s
- Transmission speed RS422 programmable per port from 4.8 through 600 kbit/s
- Eliminates the need for separate modems and RS232 or RS422 multiplexer equipment
- Fully transparent for higher layer protocols
- Unlimited distance between RS232 or RS422 equipment connected to the OTN network
- For OTN-150/600 and OTN-X3M networks

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A point-to-point circuit only requires one port, whereas a multidrop circuit needs two - making the following combinations possible (Point-to-point/Multidrop): 12/0 - 10/1 - 8/2 - 6/3 - 4/4 - 2/5 - 0/6.

In an RS232 or RS422 multidrop network, the master device simultaneously sends data to all of the slave devices that are connected to the multidrop circuits. The slave devices can reply to the master, one at a time.

A multidrop circuit can be programmed with the RTS (Request To Send) either enabled or disabled. When the RTS is enabled on a particular multidrop circuit, the device connected to those ports can only transmit data if it has activated its RTS. When the RTS is disabled on a specific multidrop circuit, the device connected to the latter can send data at any point in time.

On top of the functionality described above, the RSXMM interface card also has 4 separate RTS/CTS ports. When an external device activates its RTS signal, the RSXMM card will reply by activating the corresponding CTS signal provided the card is ready to accept data.

A higher layer protocol must be used on a multidrop network in order to prevent several devices from transmitting at the same time.

The Tx/Rx ports of the RSXMM card are full duplex ports that can be used for terminals and devices supporting the software controlled data transmission (Xon/Xoff).

For devices that do not allow software controlled data transmission, one can use either the RTS/CTS ports described above indicating local network availability, or else additional Tx/Rx ports for the control signals are used. For synchronous transmission, a second circuit (signal pair) is used for clock signals and, if necessary, a third one for RTS/CTS in the case of hardware data flow control. The transmission speed can be programmed for each port of the interface card separately. It is clear that both circuits of a point-to-point link, and all circuits on a multidrop network must operate at identical speeds.

Operation

Incoming data signals are sampled at 6.67 times the rate of the incoming data signal. These samples are inserted into the OTN frame and transmitted through the network. Hence, the transmission speed selected on a channel is the maximum speed possible, but any lower speed can also be transmitted.

In the receiving node, these bits are stripped from the OTN frame, re-assembled to the original signal and forwarded to the connected equipment. In a multidrop configuration, the received information is also copied and transmitted on the ring towards the next port of the multidrop network, etc..

In a point-to-point configuration, a circuit transmits information using the bits (bandwidth) in the OTN frame on which it receives information. In other words, the full duplex operation uses a minimum amount of bandwidth. In a multidrop network, the slave devices transmit data towards the master in a separate channel. Hence, a multidrop network uses two times the bandwidth of a point-to-point link of the same bit rate.

Applications

Terminal to host connections
In many cases, terminals are located well beyond the distance limitations set forth in the RS232/RS422 specification. To overcome these limitations, baseband modems are often used. The OTN allows a much more flexible and structured solution and RS232/RS422 distance limitations are completely eliminated.

Voiceband modems elimination
Data communication in many larger networks is done using modems connected to voice circuits, which is expensive and often limits the bit rate. OTN offers a cost effective solution, especially when combined with other transmission services.

Control information transmission
RS232/RS422 is a very popular standard used by many equipment manufacturers.
For example:

- SCADA: transmission of monitoring and control data;
- CCTV: controlling pan - tilt - zoom;
- PA (Public Address): control of amplifier equipment;
- PIS (Passenger Information System): broadcasting information.
  This equipment is very often connected in a multidrop network with a specific polling protocol running on top. The RSXMM card is fully transparent and ideally suited for connecting this type of equipment.

Specifications

The RSXMM card S30824-Q70-X is compatible with the RS232 (FB-52365-A), RS232MM (FB-52441-A) and RS422 (FB-52384-A) interface cards. With respect to point-to-point connections, it is also compatible with the RS422MD4 (FB-52384-F0A) and RS422MD6 (FB-52384-E0A) interface cards. Connections can be set up between e.g. an RSXMM and an RS232MM card.

Compatibility
RS232 EIA/TIA-232-E and CCITT V.28
RS422 EIA RS422 and CCITT V.11

CE marking
EMC directive 2004/108/EC
LVD directive 2006/95/EC

No. of Ports

- 12 ports point-to-point or 6 ports multidrop (RTS/CTS handshaking) or a combination of point-to-point and multidrop: 12/0, 10/1, 8/2, 6/3, 4/4, 2/5 or 0/6
- 4 RTS/CTS port

Data rate
0 up to 100 kbps (RS232)
0 up to 600 kbps (RS422)
selectable per channel

Bandwidth on OTN
Programmable per point-to-point service:
RS232: from 32 kbps up to 1024 kbps
RS422: from 32 kbps up to 4096 kbps
Note: 2 times the number of bits are used for a multidrop network

Transmission
Async./Sync.
Full duplex

Connectors
one 50 Pin Champ for RS232 and one for RS422, both shielded

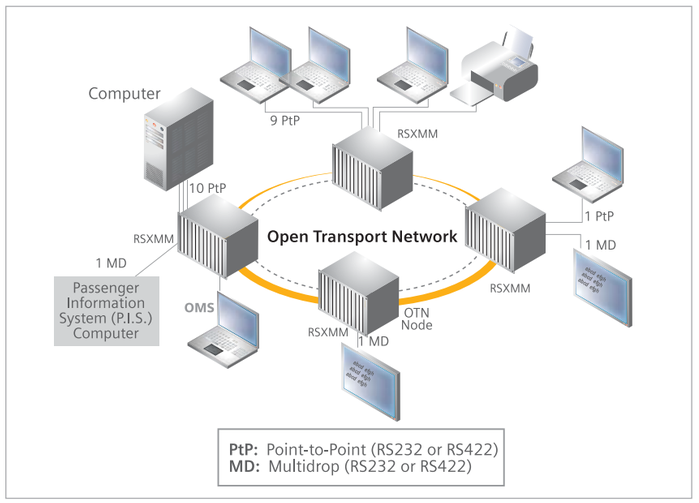
Status information
Card active/inactive
Card type
Receive data
Transmit data
RTS status

On-board indications per circuit
Card active/inactive
RTS status

Weight
Approx. 425 g

Card size
Double Eurocard
200 x 233.4 mm

Reliability (MTBF)
at 25°C (77°F): 44 years



Ordering information

Card
RSXMM S30824-Q70-X

The RSXMM card can be installed in the N22 and N215 nodes for OTN-150/600, and in the N42, N42C and N415 nodes for OTN-X3M.

OMS software release
V2.2 and up (OTN-150/600)
V4.0 and up (OTN-X3M)

OPEN TRANSPORT NETWORK (OTN)
BROADBAND OPTICAL RING ADAPTER CARD: BORA622-X3M

OTN's hardware-based design

Hardware-based versus software-based systems
The OTN-X3M switching and redundancy functionality is based on a hardware design, not a software approach. The advantages of hardware-based versus software-based system design are high reliability and transport speed.

Software-based switching systems have one or more fast microprocessors that interrogate the system data and route and switch the data to the appropriate interface cards. The disadvantage of a software-based approach the complexity of the control software which can affect operating speed and reliability.

OTN's hardware-based system design
The hardware-based design of the OTN provides the native transport of user data between the optical interfaces and the interface card in the hardware, without invasive data analysis. For that purpose the OTN system was engineered to collect/distribute node user data, insert/drop the interface card data into a TDM-based frame structure and transmit/receive the TDM frame between OTN nodes without firmware interaction.

The OTN system provides reliable high-speed, fault-tolerant network transport with a variety of external interface protocol options.

Ordering information

Nodes
The BORA622-X3M cards can be installed in the N42 or N42C nodes, 1 or 2 per node. The N415 node can be equipped with one BORA622-X3M card.

OMS software release
- OMS v5.2 and up

BORA622-X3M-8 for N42 or N42C nodes: S30824-Q123-X102

BORA622-X3M-4 for N415 nodes: S30824-Q123-X107

SFP (Small Form Factor Pluggable) modules: see separate sheet.

Introduction

Thanks to its design, the OTN (Open Transport Network) can handle nearly all existing communication standards for voice, data, LAN and video.

The system is based on dual, self-healing, counter-rotating optical rings. On top of this the OTN-X3M version of the product offers redundant central control for increased reliability and non-stop servicing.

The ring is synchronous, bandwidth is reserved by the OMS (OTN Management System) for each application, resulting in a never-blocking and fully predictable system behavior.

The BORA622-X3M, simplified to "BORA" in the remainder of this sheet, is the node's redundant common logic card, interfacing between the interface cards and the optical ring. The BORA realizes a ring with a capacity of 622 Mbps.

An N415 node can be equipped with one BORA. An N42 or N42C can be equipped with one or two BORA cards. If two BORA cards are present, one of the cards acts as hot standby card, and can take over in less than 50 ms after detection of a failure of the active BORA.

The BORA has two hot-pluggable SFP (Small Form Factor Pluggable) modules. Different modules for different distances are available for multimode and single-mode fiber. The BORA is SDH STM-4c and SONET OC-12c compatible.

FEATURES

OTN-X3M is the fully redundant version of the Open Transport Network

The BORA622-X3M common logic card is the OTN-X3M node's central control block, to be used in the N42, N42C and N415 nodes

SDH STM-4c and SONET OC-12c compliant

Works together with the Node Support Module, offering alarm inputs/outputs, fan control & monitoring, and a built-in 'get-attention' audio alarm

On-board Engineering Order Wire (EOW) with handsfree headset

10/100 Base-T Ethernet port for connection to OMS (OTN Management System) over standard IP

Allows remote software downloads without node shutdown

The BORA622-X3M has two SFP type hot-pluggable optical transceivers that can be replaced during node operation

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Functions

The BORA integrates the following functions on one card:

Microcontroller and in-band management channel
A fast PowerQUICC® microprocessor running embedded Linux, and an in-band 10 Mbps Ethernet ring, interconnecting all nodes and the network management system offer the necessary power and flexibility for the intelligent management of the node.

Controlling redundancy take-over
If two BORA cards are present, a dedicated hardware circuit on each BORA common logic card decides together with the same circuit on the 'other' BORA card, which of both BORA cards is in control. For that reason it monitors its own BORA card, and communicates with the circuit on the 'other' BORA card by means of heartbeat signals.

Via a fail-safe handshaking mechanism, one of the BORAs assumes the active role, whereas the other one goes in hot stand-by-Mode.

Controlling the node and interface cards
The BORA card tests and manages the node and the interface cards. For that purpose, a management channel offers 192 kbps full duplex HDLC-based communication between the BORA and any of the interface cards.

The BORA displays the actual ring and node status, facilitating fast troubleshooting. Special hardware allows the common logic card to remotely reset and power down individual interface cards if needed.

Managing and interfacing the optical ring
The OTN ring is managed in a distributed way by all BORAs connected to it. Upon startup the BORAs select a ring master, initialize and close the ring, and loop back if required due to broken fibers or removed nodes. No single point of failure exists.

Controlling the data exchange between interface cards and optical ring
A data connection can be either fixed or switched. A switcheable data connection can be controlled by external control programs (e.g. video). Using user domains (reserved system resources), dynamic bandwidth allocation can be combined with non-blocking operation. The switching speed depends upon the ring size, but is faster than 50 ms. Fixed connections can only be modified by the OMS.

The BORA determines which data is exchanged between interface cards and the ring, making sure no interface card will disturb data from other interface cards.

With a 32 kbps granularity the BORA can extract up to 570 Mbps of data from the ring, and exchange up to 196 Mbps with every interface card in the node.

A star shaped data path between the BORA and the interface cards allows simultaneous data transfer at full speed between the BORA card and any interface card, and avoids any mutual disturbances.

Interfacing the OMS
The OTN Management System is used to configure the BORA cards; however, once configured, the BORA cards can carry out all functions, including fault recovery, ring management and interface card replacement, without the OMS being on-line.

A 10 Mbps Ethernet ring carrying IP interconnects the OMS to all the nodes in an OTN-X3M ring.

The BORA gathers all status information from the node, the ring and the interface cards, and makes it accessible to the OMS. The BORA also receives and checks all commands from the OMS, and carries them out or passes them on to the relevant interface card.

Engineering Order Wire (EOW)
The BORA provides an interface for an Engineering Order Wire. This service voice channel may be used during installation or maintenance activities provided the optical ring is operational. A service engineer can access the EOW channel by plugging a headset with microphone into the EOW interface on the BORA front panel.

External clock synchronization
Although it is not needed for the correct operation of the OTN-X3M network, it is possible to synchronize the network to an external clock source.

An E1,T1 or 36.864 MHz TTL clock signal must be provided to the clock input of the Master BORA card, which is the BORA to which all other BORA cards in the ring are synchronized and which is located in the node having the lowest node number (address).

Functional blocks

In order to carry out all these tasks, the BORA card is equipped with two SDH/SONET termination blocks, several field-programmable gate arrays (FPGA) and a microprocessor platform.

Two SDH/SONET termination blocks terminate the SDH signal, perform synchronization and clock recovery and transfer the OTN-X3M data as SDH/SONET payload over the optical link.

The main gate array (GRIA-E = Gigabit Ring Interface Adapter - Enhanced) contains the logic to support the optical rings (i.e. generation and recognition of time-multiplexed OTN frames, synchronization with the other nodes and node reconfiguration), and exchanges data in an add/drop fashion between ring and interface cards. New FPGA configuration data can be downloaded from the OMS.

The redundancy control gate array (RCGA) contains the logic to check the BORA and to decide, together with an identical circuit on the other BORA card, on an active or stand-by state of its card.

An industrial microcontroller running embedded Linux, initializes, controls and checks the BORA card and the interface cards. The microcontroller also receives control data from the OMS, and stores it in a non-volatile RAM memory.

The data add and drop handling in an OTN-X3M node and the ring reconfiguration mechanism are not performed by the microprocessor.

If the latter should fail, the gate array continues to process the OTN ring data, in which case only the microprocessor's tasks described above are not supported, but it can be reset without disturbing the node add/drop functionality.

In case of common logic card takeover, the 'fixed' connections are enabled immediately. Switched connections (such as video) are rebuilt by the system controlling the application.

A flash EPROM contains the microprocessor's program and consists of a fixed (BOOT) and adjustable part, so it is possible to load a new firmware version from the OMS. During "downloading" the network remains operational. New embedded code, not affecting the GRIA-E, can be activated without disturbing the fixed connections, thus enhancing the system's maintainability.

Transceiver types

The hot-pluggable SFP (Small Form Factor Pluggable) modules convert the OTN ring's optical signal to an equivalent electrical signal, and vice versa.

The SFP's can be replaced via the front of the BORA.

The I (Intra-Office), S1 (Short Haul), L1, L2 and V2 (Long Haul) transceiver types are available. Their optical characteristics are listed in a separate sheet.

Operation

The OTN data is transmitted between nodes in an STM-4c or OC-12c concatenated container. The SDH/SONET link layer carries out the clock synchronization, bit error rate measurement and word alignment.

The BORA places the OTN frame in the SDH/SONET payload. The OTN frame carries both data (for the interface cards) and control signals (such as the Engineering Order Wire-EOW and inter-node communication). As a result, the SDH or SONET overhead bytes are not used by the OTN application, and may be modified by other devices without disturbing OTN.

The add/drop functionality between interface cards and OTN frame is implemented in the GRIA-E gate array, and works on a 32 kbps level (cfr. the other members of the OTN family). Error checking tests are carried out on the optical level (Optical Signal Loss), on the SDH level (B1, B2 and B3 Bit Error Rate tests) and on the embedded OTN frame (CRC check).

Specifications

Connectors

- **ETH**
  A twisted-pair RJ45 connector (10/100 BASE-T Ethernet standard) for the connection of the OMS (IP/UDP protocol).

- **EOW**
  Two 3.5 mm jacks for the EOW (Engineering Order Wire) headset with microphone (S26361-F2D87-L1).

- **SFP slots**
  Two slots for SFP optical modules. The SFP modules use LC optical connectors.

- **CLK**
  An SMB50 Ohm connector to connect an external TTL clock input signal to which the master node synchronizes (36.864 MHz or 2.048 MHz (E1), 1.544 MHz (T1) auto-select).

On-board indications
The 4-character alphanumeric display shows the BORA622-X3M type and data regarding node operation and monitoring information. A push-button allows for scrolling through extended data sets.

The Ethernet RJ45 connector LEDs indicate the OMS/OVS link status.

The SDH and BER LEDs report data transmission errors, whereas the SY LED indicates the ring's synchronization status.

An EOW LED ("CALL") is lit when an EOW headset is plugged in at one of the nodes in the ring.

Reset
A hidden reset button allows to reset the microcontroller, without disturbing the node add/drop functionality.

Status information
The following status information is available on board:

- Optical link status
- SFP type (I, S1, L1, L2, V2)
- Firmware version
- Interface card status

Temperature sensor
A temperature sensor is provided on the BORA622-X3M. The measured temperature is displayed.

CE marking
EMC directive 2004/108/EC
LVD directive 2006/95/EC

System data rate

SDH data rate:	622.08 Mbps (STM-4/OC-12)
Payload data rate:	570.570 Mbps

Optical data rate

Optical data rate	= SDH/SONET data rate
	= 622.08 Mbps (STM-4/OC-12)

Card size
The BORA622-X3M uses one system card slot position in an N42, N42C or N415 node.

Weight (with two SFPs)
BORA622-X3M approx. 520 g

Reliability (MTBF) at +25°C (+77°F)
20.4 years (=5598 FITS)

ElectroMagnetic Compatibility
Emission: EN61000-6-4, EN55022 Class B
Immunity: EN61000-6-2

Power consumption at +25°C (+77°F) (with two SFPs)

BORA622-X3M	3.6 A @ +5V
	0 A @ +12V
	0 A @ -12V

Eye safety
The integrated optical transceiver modules are class 1 laser products and comply with IEC 825-1, EN60825 and FDA21 CFR 1040.10.

Open Transport Network (OTN)
H.264/AVC 16(4) Port Video Interface Card

Nokia Siemens Networks

FEATURES

16 or 4 PAL/NTSC video input/ output ports

H.264 Advanced Video Codec

Integrated IP streaming

RS422/232/485 port for PTZ

For OTN-X3M

OTN
OPEN TRANSPORT NETWORK

Introduction

The OTN concept allows handling nearly all existing communication standards for voice, data, LAN and video. The H.264/AVC video interface card is only one of the many interfaces presently available for OTN-X3M. For more information and other data sheets, contact the address overleaf.

Description

The H.264/AVC cards are used to transmit up to 16 PAL or NTSC video signals via OTN-X3M.

Note: A 4-port version is also available for installations with a limited number of cameras per site.

Analog CVBS video signals are digitized and compressed by the video input circuit, and transmitted over the OTN-X3M network to one or more analog or IP video outputs. For IP outputs, the compressed digital video data is mapped into IP packets, while for analog outputs, the compressed digital video data is decompressed and converted to an analog PAL or NTSC signal. A single H.264/AVC card can be used both as input and output (analog & IP).

All OTN video cards provide high-quality video using the bandwidth offered by OTN-X3M.

The H.264/AVC card offers a higher compression ratio than the MPEG card (which uses MPEG2/4 compression) and the VID4E card (which uses M-JPEG compression). This allows an even higher number of video connections to be transmitted simultaneously through OTN-X3M.

Operation

The H.264/AVC video interface cards provide fixed or switched connections between video inputs and outputs, both in point-to-point and multidrop configurations.

Bandwidth for fixed or switched video applications is allocated by the

OMS (OTN Management System). The bandwidth used by the H.264/AVC codecs can be configured from 56 kbps to 10 Mbps per video connection, depending on the resolution and field rate required; 2 Mbps is adequate for most applications.

In switched video applications, the video management system, which can either be a Network Video Recorder (NVR), such as Omnicast, the OTN VENUS software or an existing Video or traffic Management System (VMS), controls the actual switching of the video channels. The OVS (OTN Video Solution software) translates commands from the VMS or NVR into OTN-X3M switching commands.

The H.264/AVC cards have 16 (4) video inputs, each with their own codecs, offering independent and simultaneous transmission. As such, all 16 (4) video inputs are available simultaneously.

The H.264/AVC card can also be used as an analog video output card with 16 (4) independent output circuits. On top of the analog output capabilities, the card can send out the analog camera images as Video-over-IP streams via its Gigabit Ethernet port.

Two RS422/232/485 control ports are provided on board for camera PTZ control or external equipment control. The compression algorithm used is the H.264 Advanced Video Codec (also known as MPEG4-part10).

Specifications

CE marking
EMC directive 89/336/EEC
LVD directive 73/23/EEC

Bandwidth used on OTN-X3M:
between 56 kbps and 10 Mbps (2Mbps typical)

Latency: Typical: 150ms

Compression algorithm
H.264 Base Line Profile Level 3 (with Main Profile extensions)

Supported resolutions:

Resolution	PAL (NTSC) H x V
D1	720x576(480)
3/4D1	528x576(480)
2/3D1	480x576(480)
1/2D1	720x288(240)
SIF	352x288(240)

Frame rate
1..25(30) fps PAL (NTSC)

Video connections:
Composite video (16 (4) inputs or outputs), CVBS, DB50F (DB50M to 16 BNC cable)

Video standard:
PAL-B/G, NTSC-M

Output signal level:
1Vpp at 75 Ohm

Signal to noise ratio
> 60dB (weighted)

Differential gain
< 5%

Differential phase
< 2.5°

Insertion gain variation
+/- 0.2dB

Amplitude vs. frequency characteristics
Bandwidth 5.5MHz (typical)

Chrominance to luminance gain inequality < 7%

Chrominance to luminance delay inequality < +/-70ns

IP Streaming port
RJ45 port with 10/100/1000BASE-T Gigabit Ethernet transceiver
- Up to 55 video over IP streams from ring + 4 local video over IP streams S30824-Q131-X101 (4-port).
- Up to 43 video over IP streams from ring + 16 local video over IP streams S30824-Q131-X401 (16-port).

Control data port
2 RJ45 ports (RS232/RS422/RS485) for camera PTZ Control or external equipment control

Card size
Double Eurocard 200 x 233.4 mm

Weight: Approx. 500 g

Reliability (MTBF) at 25°C (77°F)
> 20 Years

Power consumption:
Approx. 25W (16-port)

Applications

The H.264/AVC card is very suitable for large CCTV (Closed Circuit Television) video installations, where a high number of video camera inputs have to be collected in each node and where many video channels need to be transported through the OTN-X3M network simultaneously.

Transparent point-to-point or multipoint connections can be established for PAL or NTSC signals. This allows analog cameras (fixed, PTZ or dome) to be connected to analog video equipment such as analog monitors or video walls over very long distances.

When the Video-over-IP output feature is used, the video data is encapsulated into IP packets that can be sent to digital video display walls for monitoring purposes, Network Video Recorders (NVR) e.g. Omnicast for storage and analysis or to other PC based applications.

Video connections over the OTN-X3M network can either be fixed, or dynamically switched by a video management application or NVR. In this way, the H.264/AVC card helps to build high-quality, real-time and reliable integrated video applications.

Note: Omnicast is a registered trade mark of Genetec Inc.

Ordering information

H.264/AVC Card (16-port)
S30824-Q131-X401
H.264/AVC Card (4-port)
S30824-Q131-X101
Cable DB 50 M to 16 x BNC
S30827-C132-Axx-1

Compatibility
The H.264/AVC Card can be installed in the N42 and N415 nodes for OTN-X3M.

OMS software
OMS v5.3 and up

OVS software
OVS v5.0 and up

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